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## EXPERIMENTAL PRODUCTION OF A TRACHOMA-LIKE CONDITION IN MONKEYS

### BY MEANS OF A MICRO-ORGANISM ISOLATED FROM AMERICAN INDIAN TRACHOMA *


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This experimental work on trachoma [1] was begun in May, 1926, when, at the request of Dr. F. I. Proctor, and under the auspices of the Department of the Interior, an expedition was made to Albuquerque, N. M., where a number of pupils in the government school for Indians were to receive surgical treatment for trachoma. For the purpose of my experimental investigation several previously untreated typical cases of trachoma were selected by the school physician, Dr. Parlett, and by Dr. Polk Richards of the United States Indian Medical Service, who came to Albuquerque expressly to perform the operations. Dr. Richards and also Dr. Proctor cooperated in obtaining for me selected materials both for cultural and for histologic study. The five cases minutely studied were of from two to four years' standing, and all the patients showed some scarring at the time of operation. They were reexamined a year later by Dr. Richards, who found the lesions still active.

I had studied some cases of trachoma many years ago in New York (1909-1915) with the clinical cooperation of Dr. Martin Cohen, and I was curious to see how the Indian trachoma compared with the disease as I had seen it before. The trachoma of the Indians is especially interesting in view of its high incidence among these people, as shown by recent surveys of the United States Public Health Service, notwithstanding the fact that it is not likely to have been introduced from outside and has probably been endemic among the race for a very long time. That the diseases might not be exactly the same as that known as trachoma elsewhere seemed not impossible. To my mind, at least, Indian trachoma is a disease of unknown etiology, and my investigation proceeded accordingly.

Attempts were made (1) to transmit the disease to *Macacus rhesus* and anthropoid apes by direct inoculation of the pathologic material, and (2) to isolate as many varieties of micro-organisms as possible from the excised tarsal tissues. Five well developed typical cases were selected for investigation, and culture mediums of various kinds in very large number were inoculated, including several which in recent years have proved to be useful for the isolation of human parasites.

#### DIRECT INOCULATION EXPERIMENTS

Small pieces of the conjunctival tissue from each case were ground in a sterile mortar with saline solution, and the suspension was applied to the scarified surface of the conjunctiva and also injected into the retrotarsal conjunctival tissue of four rhesus monkeys, a chimpanzee, and an orang-utan. The rhesus monkeys were inoculated in Albuquerque; the chimpanzee and the orang-utan received material that had been brought back to New York under conditions of refrigeration. One eye was inoculated in each instance, the other being regarded as the control. None of the animals directly inoculated presented any lesions within a period of four months' observation.

#### CULTIVATION EXPERIMENTS

As was to be expected, strains of *Bacillus xerosis* and *Staphylococcus albus* were usually present. Two types of minute gram-negative bacilli were also found in practically all the cases, one motile and chromogenous, the other apparently nonmotile. The former grew well on ordinary agar slants, the other only on certain special types of medium, a semisolid medium containing fresh animal serum and hemoglobin (the "leptospira medium"), or blood agar slants containing certain carbohydrates. Another type of organism usually obtained in culture was a large, pleomorphic sarcina which grows well on ordinary mediums and produces mucin and a light brown pigment.

#### EFFECTS OF INOCULATION OF BACTERIA CULTIVATED

Since the disease under investigation was one of unknown etiology, every organism obtained in cultures was tested for its effect on the conjunctiva of rabbits and monkeys. The initial cultures were purified, and pure cultures of the second generation of each were tested in animals, the culture being introduced in the same manner as that in which the original suspension had been inoculated; i. e., subconjunctivally and also on the scarified surface of the conjunctiva. Usually only one eye of the animal was inoculated. Several animals were used in testing each group of strains.

The staphylococcus caused an acute purulent conjunctivitis in rabbits and monkeys, which completely subsided within about ten days without leaving traces on the conjunctiva. The sarcinoids and the chromogenous bacterium induced a moderate mucopurulent conjunctivitis which lasted about a week. No follicles or scar


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1. A complete report of the work, with protocols of the experimental animals, will be published in detail in a forthcoming number of the Journal of Experimental Medicine.

formation resulted. The inoculation of *B. xerosis* did not have any perceptible effect. In short, none of the strains growing on ordinary culture mediums produced any pathologic changes which resembled, even remotely, the human disease with which it was associated.

The monkeys inoculated with the gram-negative bacillus that grew only on special mediums showed nothing abnormal until from two to four weeks after the inoculation, when they developed a granular con-

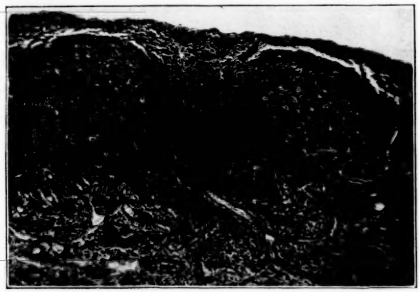

Fig. 1 (Fort Defiance case 1).—Section of trachomatous conjunctiva, Giemsa stain, showing large, well defined follicles; magnification about 52 diameters.

junctivitis which slowly progressed within from two to five months until the inoculated conjunctiva had an appearance strikingly like that of the human trachomatous conjunctiva in the early stages of the disease. The follicular lesions had gradually extended over the tarsal region, and the tarsus had become distinctly thickened. In one animal definite scar formation had taken place within about eight months after inoculation, and when the animal died from pulmonary tuberculosis the histologic changes in the lid were found to corre-

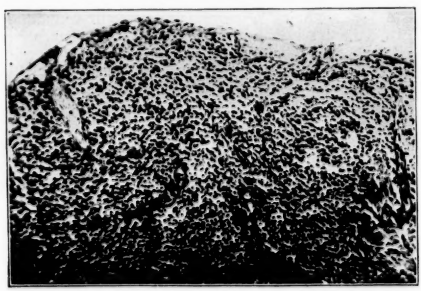

Fig. 2 (Fort Defiance case 1).—Portion of follicle near the epithelial layer. The latter is thinned out at the apex of the follicle, and hypertrophied elsewhere; magnification about 156 diameters.

spond in a striking way with those which are regarded as typical of trachoma. In this animal the condition had remained confined to the inoculated eye until it had been experimentally transmitted to the other side, but in most of the others the uninoculated eye soon became involved.

The rabbit conjunctiva was not affected by the inoculation of this organism.

### TRANSFER OF THE DISEASE IN SERIES

The lesions induced in the conjunctiva of the rhesus by the inoculation of culture were successfully transmitted to other rhesus monkeys in series, and the lesions in the passage animals are altogether similar to those in the animals originally inoculated. From a second passage rhesus monkey transfer was made to the chimpanzee, which developed the characteristic granular conjunctivitis. At the present time (May, 1927, five months after inoculation) the lesions extend over nearly half the tarsal region. The uninoculated eye remained unaffected for some time, but at the end of four months it developed granulations which are slowly advancing. From the chimpanzee the condition was successfully transferred again into rhesus monkeys (third passage).

Some of the experimental animals have been shown recently to a number of ophthalmologists, including Drs. Wilmer, Knapp, de Schweinitz, Cohen, Wootan, Verhoeff and Derby, to Dr. Guthrie of the U. S. Indian Medical Service, to Drs. Lavinder and Sprague of the U. S. Public Health Service, and to Drs. Proctor and Richards. The consensus is that the lesions closely resemble those of trachoma in man.

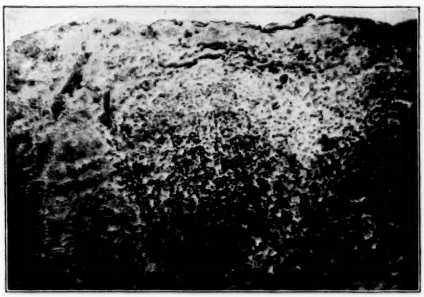

Fig. 3 (Albuquerque case 5).—Follicle less well defined; enormous thickening of epithelial layer; magnification about 156 diameters.

### HISTOLOGIC CHANGES IN THE INOCULATED CONJUNCTIVA

Before describing the changes seen in the conjunctivae of the experimental animals, it may be well to outline those found in American Indian trachoma. The essential features of the lesions in the human disease are (1) diffuse infiltration of lymphocytes mingled with plasma cells, extending along the entire length of the subepithelial or adenoid layer; (2) the presence of fairly well defined follicles, consisting of layers of lymphocytes, enclosing a mass of large round or polyhedral epithelioid cells with paler staining cytoplasm and nuclei; (3) ill defined foci of mingled lymphocytes and large epithelioid cells; (4) the presence of Leber cells within the follicle and elsewhere; (5) the presence of fine connective tissue fibrils surrounding or penetrating the infiltrated or follicular areas, and (6) the proliferation of the conjunctival epithelium, which in some places shows several layers of flattened cells, and in others is thinned out to a single layer or even ruptured by protruding follicles. In older lesions the infiltration and follicles have given place to increased numbers of connective tissue fibers, which bind the epidermized con-

junctival epithelium to the often deformed tarsus. A few polymorphonuclear leukocytes may be found in the tumid epithelial layer, but their presence is not usual.

In the monkey lesions the changes are essentially the same. There is the subepithelial lymphocytic infiltration along the narrow space between the epithelium and the tarsus; the large masses of lymphocytes and epitheloid mononuclear cells which constitute the so-called follicles or granules that protrude from the region of the fornices; the fine connective tissue fibers and Leber cells in the infiltrated area as well as within the follicles; the hyperplasia or disruption of the conjunctival epithelium over the follicles, and, finally, the advanced sclerotic changes of the conjunctiva, which occurred in one monkey. As to the types of cellular elements that are concerned in the experimental lesions, one can hardly distinguish them from those encountered in the human tissues. The characteristic papillary hyperplasia of the human tarsal region is not exactly reproduced in monkeys, owing, I believe, to the lack of the loose adenoid layer with papillary or undulating folds. However, a true papillary hyperplasia has been observed in the experimental lesions wherever there was loose subepithelial connective tissue, as in the fornices of the upper lid or in the conjunctiva of the lower lid.

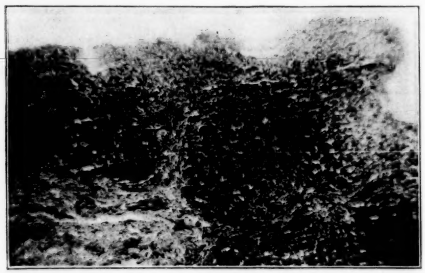

Fig. 4 (Macacus rhesus 79).—Section of conjunctiva inoculated with culture; Giemsa stain. Upper lid, thirty-seven days after inoculation. Extensive infiltration and follicles, some definitely encapsulated; magnification about 52 diameters.

### CHARACTERISTICS OF THE MICRO-ORGANISM

The micro-organism, as it appears after adaptation to artificial cultivation, has a superficial morphologic resemblance to the xerosis bacillus and other diphtheroids, but it differs from them in being gram-negative, decidedly smaller, and motile under certain cultural conditions. The last fact did not become evident until the organism had been under cultivation for some time.

The initial cultures were obtained only on leptospira medium and on blood agar plates containing certain carbohydrates, and it remains to be determined whether growth will occur on other culture mediums. The colonies on blood agar plates are moist, shining, somewhat elevated, rather minute, and translucent, with a trace of yellowish gray tint. The optimal temperature for growth is 30 C. In a young culture, grown on blood agar at 30 C., the organisms are fairly uniform in size, measuring about 0.8 to 1.2 microns in length by from 0.2 to 0.3 microns in width. The ends are rather pointed, and diploid formation is common. On leptospira medium the organism is able to grow at 37 as well as at 30 C. No motility is observed on this medium. The growth is homogeneous, never granular.

### COMMENTS

That direct inoculation with the human materials failed, while cultures induced the granular conjunctivitis, may be explained by a consideration of the peculiarities of certain other highly parasitic bacterial types. An analogous case is at hand in Oroya fever, a disease in which the blood contains large numbers of *Bartonella* yet is not infective for monkeys. Cultures of the blood parasites, however, are capable of inducing infections

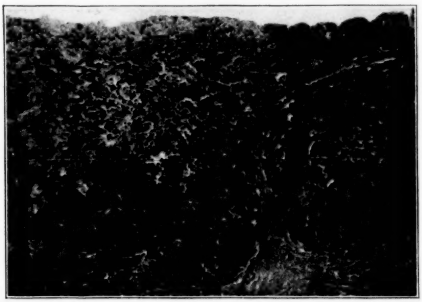

Fig. 5 (Macacus rhesus 79).—Same as figure 4, enlarged about 156 diameters.

of varying severity in monkeys. The reason for the failure of direct inoculation in such instances is probably the high natural resistance of the monkeys, which can be broken down only by the overwhelming numbers of micro-organisms contained in a culture.

The evidence in favor of the relation of the micro-organism in question to the human disease with which it was associated is found in (1) its association with four of the five cases so far carefully studied; (2) its ability to produce a chronic granular conjunctivitis which closely resembles in its clinical and histopathologic

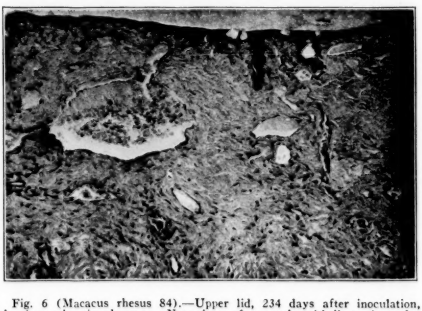

Fig. 6 (Macacus rhesus 84).—Upper lid, 234 days after inoculation, showing sclerotic changes. Note loss of normal epithelium, irregular surface of tarsus, and increase in connective tissue cells; magnification about 156 diameters.

aspects the human disease and also the experimental disease described by previous investigators who have directly transmitted trachoma to monkeys (Hess and Römer, Morax, Axenfeld, Greeff, Nicolle and his collaborators, Bertarelli and Cecchetto, and others); (3) the transmissibility in series of the experimental conjunctival disease; (4) the recovery of the micro-

organism from the experimental lesions, even in the second and third passages in monkeys; and (5) the total inability of any of the other micro-organisms isolated from the same cases to induce follicular lesions of the conjunctiva of the monkey.

Whether or not the parasite is related to forms of trachoma other than that occurring in American Indians remains, of course, to be determined by isolation of the micro-organism from cases in other localities, and possibly also by serologic examinations.

## THE USE OF QUINIDINE IN THE TREATMENT OF ECTOPIC RHYTHMS*

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The value of quinidine in the treatment of auricular fibrillation was first reported by Frey[1] in 1918. Soon after its introduction many accidents and a few fatalities occurred, and there followed numerous articles calling attention to its dangers. Many practitioners formed their ideas of quinidine during this period of relative nihilism and still refrain from its use, even going so far as to refuse it to patients whom they send to cardiac consultants. Musser[2] maintains, however, that the dangers of quinidine have been overstressed, and that fear-inducing terms still prevent it from taking its rightful place as one of our most valuable cardiac drugs.

There is at present, therefore, a reaction to this extreme position, and many changes are taking place in cardiology which make for a larger and more advantageous use of quinidine. There is a greater willingness on the part of cardiac patients to be treated in

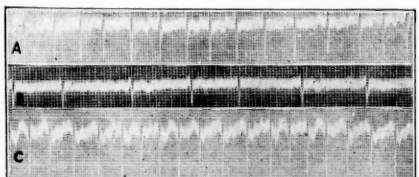



Fig. 1 (case 1).—Auricular fibrillation in which quinidine was followed by a persistent flutter: *A*, lead I, fibrillation with rapid rate before digitalis; *B*, lead I, fibrillation with slow rate after digitalis; *C*, lead I, impure flutter after 40 grains (2.6 Gm.) of quinidine sulphate in two days; *D*, leads I and III, flutter after four days of quinidine.

hospitals. Wider use of the electrocardiograph makes possible a more accurate diagnosis and serves as a check on treatment by revealing early danger signals. Better understanding of the cardiac mechanism with a growing belief that not only auricular fibrillation but other arrhythmias are manifestations of a circus movement has made quinidine a rational remedy. It is timely, then, to call attention to its benefits in carefully selected cases not only of auricular fibrillation but also of the less serious arrhythmias.

### PHARMACOLOGIC ACTION

The pharmacologic action of quinidine on the heart as shown by Lewis[3] et al. is as follows: (1) It mildly paralyzes the vagus; (2) it lowers the rate of sinus impulse discharge; (3) it causes a slight decrease in auriculoventricular conduction; (4) it lengthens the refractory period of cardiac muscle and slows conduction in the muscle, and, (5) as emphasized by Drury,[4] it lessens the excitability of cardiac muscle.

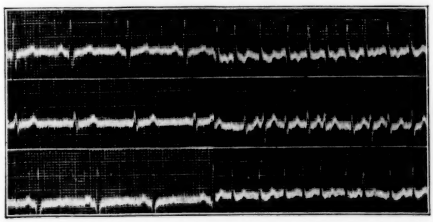


Fig. 2 (case 2).—A paroxysmal auricular fibrillation in which quinidine maintained normal mechanism; electrocardiogram between and during a paroxysm of auricular fibrillation; the ventricular rate during the attack varied from 170 to 180.

The useful therapeutic action depends on its effect on circus movement. It lengthens the refractory period, thus slowing and abolishing circus movement, but reduces conduction, which tends to fix circus movements. Whether quinidine is to abolish or fix circus movement depends on whether the preponderant effect is on the refractory period or on conduction.

Colgate and McColloch[5] show from the literature that the points on which the definition of the various tachycardias are founded are arbitrary, and conclude that the possibility of premature contraction, paroxysmal tachycardia, flutter and fibrillation being varying degrees of the same process, namely, circus movement, is very strong.

This is true for the arrhythmias not only of the auricle but also of the ventricles. As quinidine ends circus movement and all the arrhythmias have as their basis a circus movement, quinidine theoretically has a use in the treatment of all.

### QUINIDINE IN CHRONIC AURICULAR FIBRILLATION

Quinidine has had its widest use in chronic auricular fibrillation. Levy[6] collected reports of 300 cases from the literature in which from 40 to 50 per cent of the patients were restored to normal cardiac mechanism; but Wyckoff and Ginsberg report their successes as high as 68 per cent.

It is impossible to tell beforehand which patients will respond favorably, but usually the group with mitral fibrillation respond better than those with scle-

* From the Harris Clinic.

* Read before the Section on Pharmacology and Therapeutics at the Seventy-Eighth Annual Session of the American Medical Association, Washington, D. C., May 20, 1927.

1. Frey, W.: Berl. klin. Wchnschr. **55**: 417, 849, 1918.

2. Musser, J. H., Jr.: Quinidine in the Treatment of Extrasystolic Arrhythymia and Paroxysmal Tachycardia, Ann. Clin. Med. **2**: 209-214 (Jan.) 1924.

3. Lewis, T., and others: Observations Relative to Action of Quinidine on the Dog's Heart, with Special Reference to Its Action on Clinical Fibrillation of the Auricle, Heart **9**: 55 (Dec.) 1921.

4. Drury, A. N.; Horsfall, W. N., and Munly, W. C.: Quinidine and Its Action on the Dog's Heart, Heart **9**: 365 (Dec.) 1922.

5. Colgate, C. E., and McColloch, Hugh: Paroxysmal Tachycardia in Infancy, Am. Heart J. **2**: 160-165 (Dec.) 1926.

6. Levy, R. L.: Clinical Studies of Quinidine: III. Some Results of the Quinidine Treatment of Auricular Fibrillation, New York State J. Med. **22**: 276-280 (June) 1922.

rotic fibrillation; patients with small hearts better than those with large hearts, and those who have in their electrocardiograms coarse auricular waves better than those with fine waves. The duration of fibrillation is not a trustworthy criterion on which to prognosticate the restoration of a normal mechanism. Probably the most important factors in determining success are as follows: First, the predilection of quinidine for affecting either the refractory period or conduction in the auricle determines whether circus movement is to be ended or fixed. Second, the idiosyncrasy of the patient may make the dose necessary for ending circus movement too near the toxic dose. Third, and perhaps most important, is the dosage and management of the patient. In determining the dose, the method of Levy [6] is good. Idiosyncrasy should be tested for by giving on the first day two doses of quinidine sulphate of 2 grains (0.13 Gm.) each; on the second day, three doses of 6 grains (0.4 Gm.) each, and by increasing one dose a day until five doses of 6 grains (0.4 Gm.) each are given. Normal rhythm should ensue on the fifth day of treatment. In young patients who have not had heart failure, I cautiously exceed the 30 grains (2 Gm.) in twenty-four hours. It is important to give frequent doses rather than large doses at greater intervals because of the rapid excretion of the drug.

Formerly it was the custom to produce a normal mechanism with quinidine, stop the drug, hope for a continuance of the rhythm and count those cases as failures that returned to fibrillation. Quinidine should not be stopped, but the minimal daily amount necessary for continuing a normal mechanism should be determined for each individual patient. Patients have been

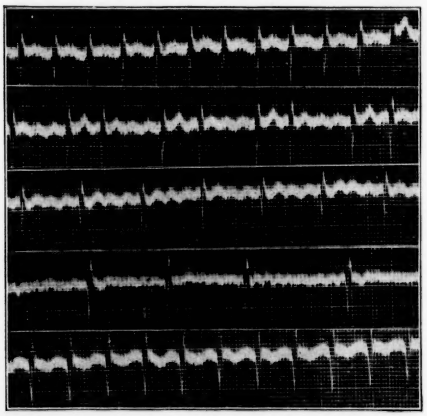


Fig. 3 (case 3).—A case of flutter, quinidine reestablishing flutter with 2 to 1 block: *A*, before digitalis; flutter with 2 to 1 block. *B* and *C*, after digitalis; flutter with 2 to 1 and 4 to 1 block. *D*, after digitalis; fibrillation with slow ventricle. *E*, after full quinidine dosage; flutter with only a 2 to 1 block and rapid ventricular rate.

rationed on as high as 20 grains (1.3 Gm.) a day for years without deleterious effect, while in others 6 grains (0.4 Gm.) is all that is necessary. This is best given in a night and morning dose.

Proper management to insure success with quinidine includes rest in bed with proper control of sleep, diet and fluid intake. Cardiac reserve should have been restored by rest and digitalis, but too recent and overdigitalization should be avoided. I have found that digitalis definitely retards the restoration of normal mechanism; its action on the auricular waves is the opposite to that of quinidine. It converts flutter to fibrillation, while with quinidine the fine fibrillary waves

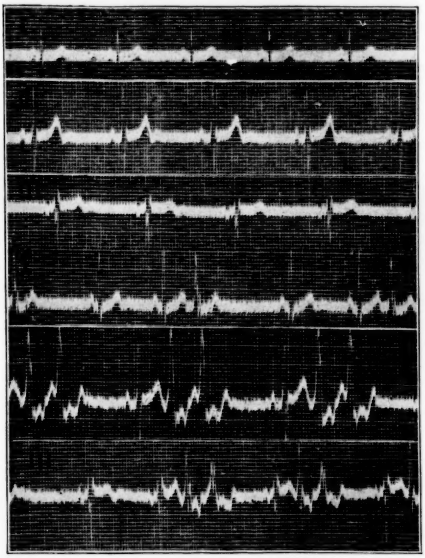


Fig. 4 (case 4).—Repeated extrasystoles, producing a slow pulse, benefited by quinidine: upper leads, regular rhythm after quinidine; lower leads, repeated premature contractions before quinidine.

become coarse and then flutter ensues, to be followed by a sinus rhythm. Digitalis should not be given previous to the administration of quinidine unless there is heart failure, and in cases in which digitalis is constantly needed to maintain cardiac competence quinidine is not indicated.

Not all patients with chronic fibrillation should receive quinidine; a competent myocardium is the criterion in selecting cases. I eliminate the aged, and those with marked hypertrophy, chronic heart failure, active endocarditis, or significant changes in the T waves or Q-R-S complexes of the electrocardiogram.

The dangers in the use of quinidine are: (1) respiratory paralysis; (2) embolism; (3) induction of ventricular tachycardia and ventricular fibrillation; (4) failure of the sino-auricular node to function when circus movement is abolished, and (5) production of auriculoventricular block and depression of stimulus production below the block. Of these the induction of ventricular fibrillation is the most to be feared, as has been emphasized by Levy,[6] who advises stopping quinidine after the onset of a persistently high ventricular rate; but this increased ventricular rate may be due to the slowed auricular rate, to flutter or to ventricular tachycardia, the first two probably being due to an insufficient dosage of quinidine and the last to its toxic action.

My experience with quinidine has been different from that of most observers. The great majority of my patients with chronic fibrillation have passed almost insensibly into their normal rhythms, but a few have had a short period of rapid heart, indicating either coarse fibrillation or flutter. I have never had a case in which extrasystoles were increased, but in nearly all they have been abolished. The type of case that has given most trouble is the following:

CASE 1.—A woman, aged 41, with mitral stenosis and auricular fibrillation, had been dyspneic and edematous for several months. Thorough digitalization produced comfort with a pulse rate of from 60 to 70, and effected a loss in weight of 33 pounds (15 Kg.). Quinidine sulphate, given cautiously to the point of cinchonism, caused several days of rapid irregular pulse, and then a regular pulse with a rate of 120. This was thought to be due to normal mechanism, but the electrocardiogram revealed a flutter which persisted and caused dyspnea at rest, scanty urine and edema. She was put back on digitalis and can now do all her housework.

### QUINIDINE IN PAROXYSMAL AND TRANSIENT AURICULAR FIBRILLATION

Even more satisfactory than its effect in chronic fibrillation is the effect of quinidine in the group of patients with paroxysmal fibrillation. Most of the members of this group, who have been women, are affected much more profoundly than are patients with chronic fibrillation. They are much more conscious of the irregularity and their ventricular rates are higher. It is useless to try to control them with digitalis, and most of them must resort to bed during attacks. In some, attacks are warded off by surprisingly small doses of quinidine sulphate, 3 grains (0.2 Gm.) a day. The following case is typical:

CASE 2.—A woman, aged 50, active in business, who had never had heart failure, came to me complaining of attacks of rapid heart, and colitis with diarrhea. The heart attacks

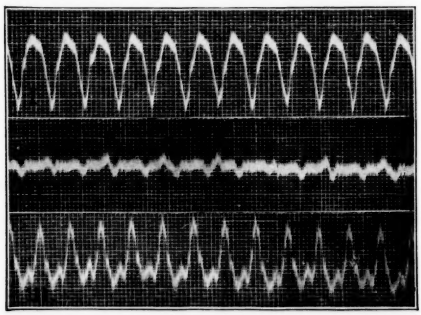


Fig. 5 (case 5).—Ventricular tachycardia of thirteen days' duration.

were often ushered in by the colitis and necessitated absolute rest. Her heart, on her first visit to me, was normal, with a slow sinus rhythm. An attempt to pass a proctoscope precipitated a rapid fibrillation. This stopped in ten minutes after the oral administration of 5 grains (0.32 Gm.) of quinidine sulphate. Ten grains of quinidine sulphate a day warded them off for months, but they returned shortly after the use of the drug was suspended. While the paroxysms, untreated, lasted for hours, they always stopped within a half hour after the administration of 5 grains of quinidine sulphate by mouth.

### QUINIDINE IN AURICULAR FLUTTER

I have treated only two cases of flutter, one of which yielded nicely to quinidine when administered without the previous use of digitalis. The other, case 3, was that of a man, aged 60, who had had evidence of mitral and aortic valve disease for twenty years. He came under my care during his first actual confinement to bed and was found to have many valvular lesions and

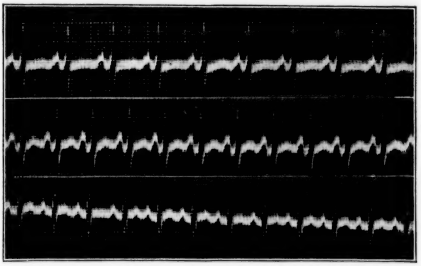


Fig. 6 (case 5).—Sinus mechanism following two doses of 0.3 Gm. of quinidine sulphate given intravenously twenty minutes apart.

a greatly dilated heart without reserve. The cardiac rate was 160 and regular; the mechanism, auricular flutter with 2 to 1 block.

There was no combination in which digitalis and quinidine could be used that would induce a normal mechanism, but the administration of quinidine was always followed by flutter with the low grade 2 to 1 auriculoventricular block. In this case quinidine certainly did not cause any degree of auriculoventricular block, but its administration was followed by a lessening of block, so that the bundle could transmit impulses at the rate of 160 a minute even though there was a preexisting digitalis block.

### USE OF QUINIDINE IN PREMATURE CONTRACTIONS

Patients with premature contractions are the most annoying ones. They are troubled by a feeling that the heart turns over and then stands still; the fear thus inspired often causes tachycardia. I have been able to abolish this arrhythmia in more than 90 per cent. Premature contractions arising in either the auricle or the ventricle yield equally well to the treatment, which, as a rule, need not exceed three doses of 5 grains (0.32 Gm.) a day. After a short time, from 5 to 10 grains (0.32 to 0.65 Gm.) suffices. The disadvantage is that the pulse is usually higher, owing to the action of quinidine on the vagus. The advantages are that it tides the patient over a nervous period of cardiac consciousness, and impresses him with the fact that something can be done for him. He usually stops treatment because it is more troublesome than the disability, but he feels that this is his weakness rather than the physician's.

Most premature contractions do not affect the circulation, though frequently repeated. In some who may normally have a slow pulse the extrasystole may come so often as to cause giddiness and mild dyspnea. This is particularly true if the extrasystoles are not transmitted to the pulse, when a condition of bradysphygmia is produced in which the pulse rate may be as slow as 30.

CASE 4.—A man, aged 36, who had had a recent cold and maxillary sinusitis, was referred to me because of supposed heart block, as the pulse was irregular and had a rate as low as 30. Auscultation and the electrocardiogram proved the trouble to be due to repeated extrasystoles. Fifteen grains (1 Gm.) of quinidine sulphate produced a normal cardiac mechanism, which was maintained by from 5 to 10 grains (0.32 to 0.65 Gm.) a day until his infection was cleared up, after which extrasystoles occurred only occasionally.

### QUINIDINE IN PAROXYSMAL TACHYCARDIA

I have found quinidine fairly reliable in auricular paroxysmal tachycardia. Most patients who take the drug consistently are relieved of attacks; in others who take it only when attacks become numerous it is difficult to gain an idea as to its efficiency.

Felberbaum[7] in 1923 collected reports of eighteen undoubted cases of ventricular tachycardia, which shows the condition to be relatively rare; but since then case reports indicate that it is less rare than was formerly thought. In some, normal mechanism has been restored by quinidine. I have had one case (case 5) in which the diagnosis was proved by the identification of independent P waves in lead II, and in which quinidine gave remarkable results. The patient was a man who had had hypertension and mitral disease for many years. During the two months before admission he had had numerous attacks of cardiac pain, the last one of which was thought to be coronary thrombosis. Thirteen days before admission he had developed a pulse counted by his physician at 180, which digitalis would not slow. I found a ventricular tachycardia with a rate of 214. After the second intravenous dose of 0.3 Gm. of quinidine, the rate dropped to 80 with a sinus mechanism. He is still alive one and one-half years afterward, but must continue using digitalis.

The effect of quinidine on ventricular extrasystoles and on ventricular tachycardia is interesting because of the numerous reports as to its rôle in producing identical arrhythmias.

### SUMMARY

1. The dangers of quinidine have been overstressed.

2. It is a useful remedy in all cardiac arrhythmias produced by circus movement.

1025 Fifth Avenue.

## ABSTRACT OF DISCUSSION

DR. ALBERT A. HORNOR, Boston: We ought to be grateful to Dr. Barrier for emphasizing the fact that the fear of quinidine has been overestimated. It has been particularly said that persons who had failure should not be given it because they are much more likely to have emboli and die of cerebral embolism as a result. With this in mind, Sidel and Domart of the City Hospital in Boston asked whether they might give quinidine to patients who were fibrillating and had failure and who we thought were going to die. None of the patients had embolism. One of the patients in whom failure persisted and the auricular fibrillation rate remained quite high did develop ventricular fibrillation. I feel that she died as a result of quinidine, but I feel quite definitely that she would have died if she had not had it. Contrast this with the fact that in the fibrillating cases of less than one year's duration, fibrillation stopped in 70 per cent. The others, for the most part, did not yield to quinidine. We went higher in dosage than Barrier reported, one patient getting 150 grains (10 Gm.) a day, and a total of 1,200 grains (78 Gm.) of quinidine. I should like to ask him if he has had experience with patients being symptomatically greatly benefited by quinidine with a persistent fibrillation.

DR. R. F. LEINBACH, Charlotte, N. C.: I should like to add my testimony to what Dr. Barrier has said with regard to quinidine. I have observed in my locality in North Carolina that physicians are reluctant to administer quinidine. This is probably to be attributed to the warnings given when quinidine was first reintroduced to the profession. With one single exception, I cannot recall a case of impure flutter or coarse fibrillation that did not yield to quinidine. The one exception was a patient who went into coarse fibrillation immediately after operation and died of postoperative complications. My other cases of this form of fibrillation have invariably yielded to quinidine. I have used larger doses than Dr. Barrier has, but have never exceeded a total dose of 150 grains (10 Gm.), 15 grains (1 Gm.) a day for ten days. In fibrillation of long duration I have not yet obtained any results and doubt its efficacy in such old cases. I think that perfectly good anatomic reasons can be adduced for this. When the auricular wall has become thinned out to a degree at which it cannot contract as a unit, one could scarcely expect to restore a normal mechanism. I have used quinidine only rarely in cases of extrasystoles. In the ordinary case with six, eight or ten ventricular premature beats a minute, it does not seem wise to administer it. These premature beats are matters of no importance, and the sooner the patient is told that they do not increase his liability of death or disability and that, while they are subjectively disturbing, he had better forget about them, the sooner his equanimity will be restored. When told that one half of the race shows this form of disturbance at some time or other, he usually becomes reconciled to the condition. More complicated forms of premature beats may require quinidine. I have seen only one case of ventricular tachycardia. I did not give quinidine in that case because the patient was not under my care. This form of tachycardia is characterized by brief paroxysms of very rapid heart action. The patient to whom I refer had at least four paroxysms, each of about five minutes' duration, within half an hour. The proof of the beneficial effects of quinidine in this condition are to be found in the suppression of the paroxysms themselves and not in the fact that a single paroxysm is terminated in a few minutes. I think that quinidine is a valuable drug and I am sure that cases are seen by a great many physicians in which the drug should be administered but is not, because of fear of some untoward effect.

DR. C. W. BARRIER, Fort Worth, Texas: I have never seen any benefit to the circulation from quinidine where a normal mechanism was not restored; on the contrary, I have seen in some cases a normal rhythm restored, and the circulation was benefited very little, if any. I occasionally give larger doses of quinidine than those mentioned in my paper, but I think that the doses mentioned are safe ones. Of course I do not give quinidine to every patient who has extrasystoles but only to those who are much concerned over their cardiac irregularities. I tell them first to forget, but I do not tell them too often to forget it, for they forget me more often than their extrasystoles.

7. Felberbaum, David: Paroxysmal Ventricular Tachycardia, Report of an Unusual Case, Am. J. M. Sc. **166**: 211-222 (Aug.) 1923.

**Instinctive Acts Uncommon.**—Extensive as is the native equipment of man, with its manifold sensations and emotions, movements and interests, it would bulk rather small, numerically, in an inventory of the whole equipment of the adult. Seldom, except in the internal workings of the body, does one perform a purely instinctive act. Previous learning has usually come in and given modified forms of behavior. We act as we have learned to act, see what we have learned to see, are interested in what we have learned to be interested in, enjoy what we have learned to enjoy, and dislike what or whom we have learned to dislike. Yet it would be a great mistake to suppose that the adult had "scrapped" his native equipment —except in relation to digestion and similar internal processes —and built up for himself an entirely new outfit, by means of which he carried on his rational adult activities. The native equipment, or much of it, remains in use and is built up into the more complex and specialized mechanisms of learned activity.—Woodworth, R. S.: Dynamic Psychology, p. 77.

# ORBITAL MENINGO-ENCEPHALOCELE ASSOCIATED WITH MICROPHTHALMIA

REPORT OF A CASE *

MARTIN COHEN, M.D.
NEW YORK

An orbital meningo-encephalocele with microphthalmia is a very rare condition. Few reports appear in the literature, and for this reason, and also because of the difficulty in its diagnosis and surgical treatment, this case is presented.

## REPORT OF CASE

An Italian girl, aged 6½ years, was admitted to the Manhattan Eye, Ear and Throat Hospital, Oct. 15, 1926. The child's parents were 30 and 40 years of age, respectively, and had always been in excellent health. They had two other children, one younger and one older, both in normal condition, and not showing any congenital anomalies. The mother stated that this child was born with the existing eye condition. The patient was well nourished and bright, and did not evince mental symptoms. No congenital anomalies existed except those present in both eyes. The teeth were in bad condition, enlarged cervical glands were palpable on the left side, and a slight nasal discharge was present; otherwise the physical condition was normal. The laboratory reports on the urine, the chemical analysis of the blood, the differential blood count, the blood Wassermann test, and the Pirquet reaction were all negative.

The roentgen-ray examination of the skull was made by Dr. F. M. Law, who reported that the right orbit (fig. 1) was larger than the left in all diameters; its optic foramen was markedly enlarged, circular and clear, and did not show erosions. It measured 6.5 by 6.5 mm.; the enlargements were probably due to an embryonal maldevelopment. The left orbit (fig. 2) was of normal dimensions; its optic foramen was of normal size, measuring 4 by 5 mm. There were two small areas on the anterior aspect of the roof of the orbit, just alongside the upper margin of the ethmoid cells. This might have been a perforation through the roof; however, this was not evident at operation, as there was present in these areas a roughened surface due to adhesions between the cyst wall and the orbital periosteum. The dimensions of the sphenoidal fissures of both eyes were normal.

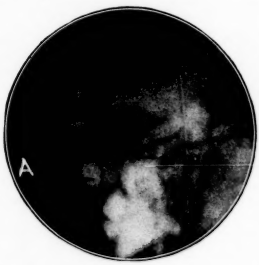



Fig. 1.—Left bony orbit: *A*, optic foramen.

Fig. 2.—Right bony orbit much enlarged: *A*, enlarged optic foramen.

The eye examination revealed that the vision of the left eye was 20/200; it could not be improved, as it was due to a congenital amblyopia. The field of vision for form was normal; horizontal nystagmus was present; the pupillary light reaction was normal, and the external examination in other respects and the fundus were normal.

The right eye had a partial ptosis of the upper lid, which condition was of congenital origin. The lid was not thickened. The eyeball presented an exophthalmos of about 5 mm.; the vision was nil, and the conjunctiva was congested. The cornea was transparent and small; the anterior chamber was deep; the iris showed atrophic patches without reaction to light, owing to synechia and degeneration of the eye; the pupil was moderately dilated; the lens was completely cataractous, and transillumination was present. The intra-ocular tension was diminished. The eyeball was turned downward and inward; its contour was flattened on its superior surface, as a result of pressure of an epibulbar mass; lateral nystagmus was present, and the motility of the eye was limited in upward rotation. Bruit was not heard by auscultation over the eyeball or the

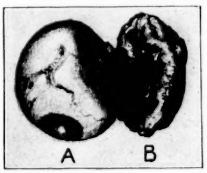



Fig. 3.—*A*, eyeball compressed above and rotated on axis; *B*, collapsed meningo-encephalocele.

Fig. 4.—Meningo-encephalocele opened and cavity dilated.

superimposed mass, nor was an increase in the exophthalmos produced by coughing or by a marked bending forward of the head. A large epibulbar soft mass was seen surrounding the eyeball (fig. 3); it had a few constricting bands over its surface due to stretching of the overlying muscle fibers. The mass extended alongside the eye and deep into the orbit. Pressure on it did not decrease its size or cause cerebral manifestations that might indicate a direct communication with the brain.

The diagnosis of microphthalmia was made, as the eyeball, especially its cornea, was small. The eye, as already noted, showed a secondary chronic iridocyclitis and a complicated cataract. The fundus could not be seen. As regards the nature of the epibulbar mass surrounding the eyeball, a definite diagnosis was not made but the possibility of several conditions was considered; namely, a plexiform neuroma, a dermoid or serous cyst, and a meningo-encephalocele. A definite diagnosis could not be made. This could be determined only after removal of the mass and the report on the microscopic appearance of its wall and contents. The meningo-encephalocele may enter the orbit either anteriorly through the nasofrontal or the orbito-ethmoidal foramina, or posteriorly through the optic foramen or the sphenoidal fissure. As there was an exophthalmos present, the posterior foramina seemed the most probable sites of exit. The optic foramen being decidedly enlarged, it was presumed that the meningo-encephalocele entered the orbit through this foramen. As the eye was proptosed and completely blind, and also surrounded by a large soft mass that was liable to trauma and infection, I advised an operation, to consist of enucleation of the eyeball, this to be immediately followed by a total extirpation of the epibulbar mass. The parents consented to this procedure.

A general anesthetic was administered. The necessary precautions were taken, as the possibility of a meningo-encephalocele was considered. The eyeball was first enucleated. The optic nerve, on being severed, was found to be displaced owing to the misshapen eyeball. After the enucleation, the large epibulbar mass was approached. It was first separated from its surrounding tissue with blunt dissection; to free it from the orbital roof, the two areas previously mentioned had to be carefully separated, and then the mass was gently freed laterally. When the mass was exposed, it appeared about the size and shape of a large walnut; its surface was smooth; it

* Read before the Section on Ophthalmology at the Seventy-Eighth Annual Session of the American Medical Association, Washington, D. C., May 18, 1927.

was of a soft and fluctuating consistency and was grayish. Aseptic aspiration of the mass was not performed, as a collapsed mass might interfere with its ready removal; also a remote infection was possible. During the operation, the mass suddenly became smaller. Whether this was due to manipulation causing a small perforation or to fluid escaping into the cranial cavity, I was unable to say. Toward the close of the operation the patient appeared to go into collapse; the pulse became suddenly weak and almost imperceptible. Stimulation was at once given, and then the operation was continued by being rapidly extended to the orbital apex, where the pedicle of the mass was promptly severed with scissors. Catgut was not used to tie off the mass, though it was kept in readiness, since speed was necessary. The lids were then closed and an eyepad and compression bandage were applied. Following the operation, the patient did not show unusual symptoms. As the microscopic examination of the mass after operation showed the growth to be a meningo-encephalocele, she was kept in the hospital five weeks for observation, in case any unusual manifestations presented themselves.

Six months after the operation the child is in perfect health and is wearing an artificial eye. The facial disfigurement has been partially corrected and there is no evidence in the orbit of any recurrence.

A pathologic examination was made of the right eyeball and its epibulbar mass (fig. 3). Grossly, the eye measured 25 by 22 by 17 mm. It was of a soft consistency and was flattened laterally. The optic nerve was thin and displaced, owing to the distortion of the globe. The cornea was small and clear, but the globe was not reduced in size after removal. This was not apparent before operation, as it was covered to a great extent by the epibulbar mass; at the same time, it is possible that as the eyeball was stretched and thinned by the overlying mass, it might have been small originally. The pupillary area was accompanied by the yellowish complicated cataract. The epibulbar mass, after removal, was collapsed; therefore its contents could not be examined. It measured 27 by 22 by 14 mm. Its external surface was smooth and a distinct pedicle was not seen. In the bisecting of the mass, a large cavity

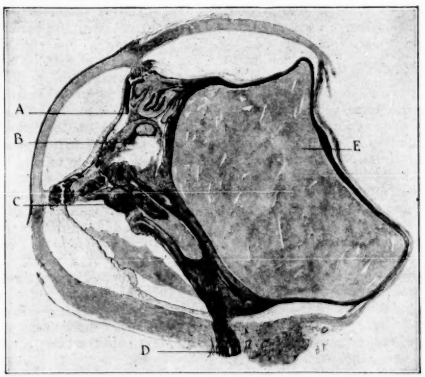



Fig. 5.—Section of eyeball: *A*, total posterior synechia of iris; *B*, cyclitic membrane; *C*, detached retina and choroid; *D*, optic nerve; *E*, cyst of retina.

was opened (fig. 4). It was lined by a fine membrane which could be peeled off. The wall of the cyst varied in thickness from 2 to 7 mm.

The pathologic material was hardened in Zenker's fluid, and then embedded in celloidin; serial sections were made, which were stained with hematoxylin, Mallory's phosphotungstic acid, and the van Gieson and neuroglia stains.

A microscopic examination of the eyeball showed that communication did not exist between the globe and the surrounding cyst wall. Figure 5 is a low power drawing of a microscopic section of the eye, demonstrating a total posterior synechia. A dense cyclitic membrane was seen behind the calcified lens, the latter being removed before the eye was sectioned. A total detachment of the retina was present, extending from the optic disk forward, where it was folded on itself and blended there with the ciliary processes and the cyclitic membrane. The large cavity or retinal cyst (fig. 5D) contained an albuminous exudate and cholestrine crystals. The cavity was lined by a thick and proliferating neuroglia tissue which expanded from the disk and fused with a portion of the nerve fiber layer of the retina. The choroid was loose in structure, and detached and absent in

Fig. 6.—Section of wall of meningo-encephalocele: above, islands of brain tissue; below, meninges.

places. The anterior chamber was deep, owing to the contraction of the cyclitic membrane, which connection, posteriorly to the lens, caused its recession. The sclera was thin over its flattened area. A large dense fibrous tissue mass was adherent to one side of the optic nerve. This was severed when the enucleation was performed.

High power examination of the structures already mentioned revealed that the cornea, although small, did not show pathologic change. The sclera was thin over its ecstatic portion. The vortex vein showed an increase of polymorphonuclear cells. The iris was markedly edematous and infiltrated with lymphocytes; patches of atrophy and a proliferation of pigment were seen. The vessels showed an increase of polymorphonuclears. The peripheral angle of the anterior chamber was free. Fontana's spaces showed a proliferation of the endothelium. The ciliary body was partially detached, as a result of the contraction of the surrounding cyclitic membrane. The ciliary processes were atrophied, distorted and detached because of their attachment to the cyclitic membrane. The choroid was of loose structure and was, as already mentioned, detached and absent over areas. Excrescence of the lamina vitrea was seen. The detailed structure of the retina was lost, and its nuclear layer was evident only over sparsely scattered spots. A portion of the retina with its nerve fiber layer was expanded so as to form a dense glial surface, which lined the retinal cyst. The blood vessels of the retina showed an increase of polymorphonuclear cells. Calcific deposits were seen in the retina.

The optic nerve was atrophic and showed an increase of neuroglia tissue. Its meninges showed an increase of the endothelium and an infiltration of polymorphonuclear cells.

The wall of the cyst, as seen at microscopic examination (figs. 6 and 7), presented on its innermost layer several islands of brain tissue which had a tendency toward a convolution pattern. This structure was still highly primitive. Glial element as well as neuroblastic structure could be identified; external to these islands there was a wide zone of connective tissue, rich in blood vessels. The latter very likely presented all of the meningeal coverings. These observations typify a meningo-encephalocele.

As regards the cause and relationship of microphthalmia associated with meningo-encephalocele, two main theories have been suggested by various authorities; namely, maldevelopment and an inflammation. A study of the clinical and pathologic conditions presented in this case impress on me the opinion that the microphthalmia is due to the pressure effect of the meningo-encephalocele on the developing eye. The meningo-encephalocele, owing to a defect in the embryonal development of a section of the brain, protruded through the enlarged optic foramen, where it developed. In time, its communication to the brain proper became occluded.

1 West Eighty-Fifth Street.

## ABSTRACT OF DISCUSSION

DR. EUGENE M. BLAKE, New Haven, Conn.: The differential diagnosis of pathologic processes in the orbit is always difficult, and tumors in this cavity are infrequent. Among the least common of these tumors are hernias of the brain and its coverings. Aulano, writing in 1925, found that about fifty cases had been reported in the literature, but only three since 1915. These cysts, formed of brain or its covering, are even rarer

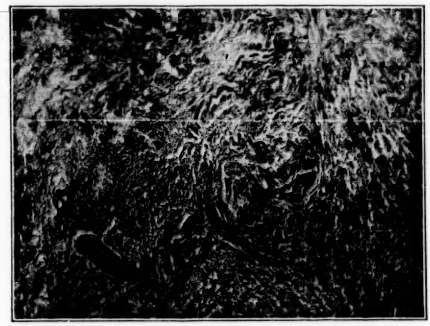


Fig. 7.—High-power view of figure 6, showing glial elements and neuroblasts.

in the orbit than in other parts of the skull. Of the cases reported, the great majority occurred at the inner angle; occasionally there were cases at the outer angle, and least frequently at the apex of the orbit. Therefore, Dr. Cohen's case is an example of a rare tumor appearing at an unusual site. In the more frequent location, at the inner part of the orbit, the hernia usually occurs between the frontal and ethmoid bones, preventing a development of the horizontal plate of the ethmoid. This, Larger states, is the line of the first branchial cleft. Dr. Cohen stated in a paper recently published that cases of microphthalmos associated with meningocele are simply an expression of inflammation early in the life of the embryo. Other congenital defects are not infrequently found in patients with meningo-encephalocele, such as cyclopia, spina bifida and genital maldevelopments. Unfortunately, few cases of meningo-encephalocele have been studied histologically. Meningo-encephalocele appearing at the apex of the orbit cannot be diagnosed before operation. The tumor masses to be differentiated are dermoid or serous cyst, plexiform neuroma, angioma, meningocele and, possibly, sarcoma. If present at birth, a dermoid or encephalocele tumor is most likely. When the latter connects with the brain cavity, pressure on the mass will evoke cerebral symptoms, such as dizziness, nausea, convulsions and coma. In such cases, removal of the growth is fatal. Usually the pedicle becomes constricted, as in the case just reported, and the growth may be safely extirpated. There seems to be no doubt of the accuracy of Dr. Cohen's view that in his case the pressure of the cystic mass resulted in arrested development of the eyeball. The presence of proliferating neuroglial cells in the globe is further proof of arrested development. The assistance rendered by roentgen rays is worth noting, for by this means the enlarged optic foramen was recognized before operation. This refutes the statement of some writers that roentgen rays are of no value in making a diagnosis, owing to the soft condition of the bones in children.

DR. LEWIS W. CRIGLER, New York: It was my privilege to assist in the performance of this operation. As the tumor mass was entirely cut off from its intracranial origin, it is not surprising that an exact diagnosis could not be made. The only two signs present suggestive of meningocele were a dilated optic canal, and the congenital maldevelopment of the eyeball. These two conditions often occur independently and from other causes. When communication with the cranial cavity still exists, diagnosis becomes less difficult, but operative intervention more hazardous. It is then possible, by pressure, to reduce the size of the cyst and elicit other symptoms indicative of the condition. The edge of the bony dehiscence can sometimes be felt. Operation is to be avoided unless there are signs of enlargement of the cyst or evidence of disturbed cerebral function. In this event, it would seem wise to secure the assistance of a competent brain surgeon, and defer to him the further management of the case. The hernia usually passes between the ethmoid and frontal bones at the expense of the horizontal plate of the ethmoid. When occurring in this location, it is sometimes mistaken for a distended lacrimal sac. Both the macroscopic and the microscopic changes in the eye were those of a severe plastic inflammation which had run its course and subsided. It is difficult to account for these changes on the basis of pressure alone. Must there not have been some other exciting factor? Is it not likely that the pressure resulted in an altered blood supply, which, in turn, lowered the resistance of the parts affected, thus inviting infection? The eyeball was not of the usual microphthalmus type, but one in which there had been a softening and shrinking of the globe. There was present, however, a true microcornea.

DR. F. P. CALHOUN, Atlanta, Ga.: I have found that a histologic diagnosis of an orbital cyst, if Dr. Cohen will permit me so to regard his case, is often as difficult as the clinical diagnosis. I have now under study an infant's globe with an attached orbital cyst, and I am uncertain whether the picture is one of coloboma of the optic nerve with a cyst of the sheath, a coloboma of the choroid with an orbital cyst, or an orbital meningo-encephalocele associated with the eye malformation, for they all have many characteristics in common. On account of stress of circumstances, Dr. Cohen was not able to dissect the cyst free from its apical attachment, or to note whether the optic nerve was present at the enlarged foramen. I mention this to suggest that a cystic distention of the cerebral end of the optic sheath may have been the origin of the orbital cyst which he describes, particularly as it was his belief that the cyst originally had emerged from the foramen. For a meningo-encephalocele to protrude through a maldeveloped or enlarged optic foramen, without impairing the development of the cerebral part of the nerve or its sheath does not seem possible.

In the consideration of developmental malformations of the eye, we should not lose sight of the fact that should the embryologic growth of the eye be altered at the several critical moments determined for the origin for the different structures, its structural arrestment or alteration rarely recovers from this modification, even though a normal rate of development be subsequently established. Stockard has proved this in his experimental work on the abnormal and arrested embryonic development in the eyes of vertebrates and mammals. Dr. Cohen's case, the left eye being normal in structure, but defective in vision, suggests an abnormal development of some portion of the nerve, especially considering what he has so well said regarding the right eye.

DR. MARTIN COHEN, New York: The examination showed glial structure and typical convolutions resembling those of the brain; the external portion of the area showed tissue which to my mind could be recognized. I have not been able to say

positively whether this is retina or dura. However, the tissue which represented the convoluted areas showed neuroblasts and glial tissue which I cannot mistake for anything else but brain substance—the brain meninges which have found their way, owing to this large optic foramen, into the orbital cavity. It seems to me that there is nothing else to consider in this case except a typical meningeal structure.

## COMPLETE CLOSURE OF THE BLADDER FOLLOWING PROSTATECTOMY *

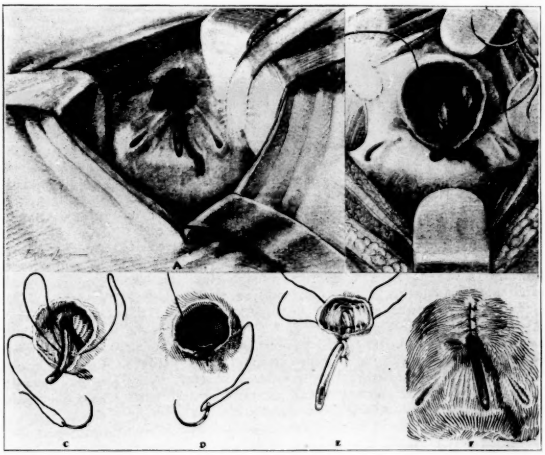
PRELIMINARY REPORT

W. E. LOWER, M.D.
CLEVELAND

A surgical operation in which drainage must be instituted is never an ideal operation. The necessity for drainage indicates either that some adverse condition is present, such as a pus-forming focus, as in suppurative appendicitis with peritonitis, or the danger of bile leakage after a cholecystectomy; or that the technic of the operation itself is such that danger of hemorrhage or oozing makes complete closure impracticable. It is this last possibility which has been the principal reason for the suprapubic drainage of the bladder after a prostatectomy, although the presence of a severe cystitis also contraindicates closure in some cases.

For many years I have always closed the bladder after the removal of bladder stones or bladder tumors, and have maintained bladder drainage by means of an inlying urethral catheter; but until recently I have always employed a suprapubic drain after prostatectomy, partly because that is the general practice and partly because of the postoperative oozing which nearly always occurred. I have never felt, however, that a technic which necessitated such a procedure was ideal. I felt sure that, if a method could be devised whereby the hemorrhage could be completely controlled, there could be no objection to closing the bladder primarily and depending on an inlying catheter for urinary drainage. To this end I have adopted a method whereby the bleeding is entirely controlled by suture, and have discarded the use of packing or of any kind of distensible bag. This method has now been employed in a series of fifty prostatectomies, in most of which the bladder has been closed at the time of operation. In a few instances a rubber tube has been inserted suprapubically for a few days. This method is illustrated by the accompanying drawings. A catheter is passed through the urethra. A dot-and-dash stitch being used, a suture is then passed from the bottom of the cavity from which the prostate has been removed, along the wall of the cavity up through and including a small margin of the mucous membrane of the bladder (*B*). The needle is then removed and rethreaded on the other end of the suture and the same procedure is carried out on the opposite side (*C*). With this suture the walls of the cavity are brought in apposition, snugly but not tightly, and the catgut is cut short. Catgut number 0, or not heavier than number 1, should be used. This suture is inserted below the catheter (*D*); the next suture is inserted above the catheter, and as many more are applied as may be necessary to close the cavity (*E*). The tag-ends of the mucous membrane are all trimmed off so that a good approximation can be made, thus facilitating healing and preventing the possibility of a tag's dropping into the urethra and causing obstruction (*F*). One fine catgut suture is then passed through the catheter to hold it in position. It is well to use a good-sized catheter that has two openings, so that if one opening becomes occluded, drainage will probably be assured through the other. Of course, if there are any spurting vessels they are caught and tied before these sutures are closed.

By this method the hemorrhage can be absolutely controlled as far as any oozing through the bladder is concerned. Of course there may be some oozing along the urethra, discharging at the meatus, but this is never of any consequence. With the bladder as dry as it can be made, there is no reason why the bladder cannot be closed. If the cut edges of the bladder are brought in apposition the sutures need not be made very tight, but there must be no protruding of the mucous membrane such as nearly always follows drainage and is responsible for the delayed closing of the suprapubic fistula.




Technic for closure of capsule after prostatectomy.

A soft rubber cigaret drain is placed in the space of Retzius for a few days.

Since I have been employing this technic I have found that the period of convalescence is shortened; that postoperative care is lessened, and that the incidence of suprapubic fistula is reduced to a minimum.

Certain postoperative complications may occur unless special precautionary measures are taken: First, a stricture at the vesical neck may develop. This danger may be obviated by dilations for a short time after operation. Second, if too heavy catgut, especially

* From the Cleveland Clinic.
* Read before the Section on Urology at the Seventy-Eighth Annual Session of the American Medical Association, Washington, D. C., May 19, 1927.

chromic catgut, is used, the knots left in the bladder may act as a nucleus for the formation of stones. I have had one case in which I suspect that the formation of a stone was due to this cause.

As in any series of operations, death may occur from causes that are not entirely under our control, such as emboli, pneumonia and cardiac failure. In this series there was one death from pulmonary embolus on the fifth day after the operation, in which sacral anesthesia was employed, careful manipulations were used throughout, and hemorrhage was completely controlled.

There should be no deaths from shock and none from hemorrhage, two causes which formerly were the principal contributing factors in the mortality rate attending operations on the prostate gland.

Since operations on the prostate gland are practically always performed on patients who are debilitated by age and the conditions which result from urinary obstruction, any procedure that can simplify the operative technic and promote postoperative comfort should be employed. I believe from my experience to date with the method described that a closer approach to an ideal technic for the performance of prostatectomy has been attained.

Euclid Avenue and Ninety-Third Street.

## ABSTRACT OF DISCUSSION

DR. A. L. CHUTE, Boston: I have been very much interested in Dr. Lower's ingenious operation. I wish, however, to give a word of caution to those who are not familiar with Dr. Lower's dexterity; do not go away with the idea that because an operative procedure is possible for him it will necessarily be possibly for you or for me. Dr. Lower is, I believe, the most expert operator in the field of urinary surgery, and I am convinced that this method will be found to be tremendously difficult technically in the hands of any one but Dr. Lower. In the days when we removed the small bladder papillomas by open incision, occasionally I would close a bladder tight. I was successful with perhaps half of the cases; the rest broke down. I am of the opinion that in the long run we shall be better off if we go ahead, slowly draining these patients. A considerable proportion of our patients with prostatic obstruction have an infected bladder, and I am quite sure that Dr. Lower would not consider such cases as suitable ones for this procedure. Even with a very mildly infected bladder I should fear the danger of serious infection of the perivesical space from urinary contamination in cases in which the bladder was closed. I fear an attempt to follow Dr. Lower's ideal procedure would lead many men to abandon the less brilliant and more time consuming two-stage operation, which we all will admit has its disadvantages but which nevertheless enables us to save many prostatic patients whom we could not otherwise save. Dr. Lower's theoretically ideal operation is very alluring, and I shall look forward with great interest to hearing how his next fifty cases come on, but in the meantime I shall not attempt to follow in his path.

DR. GILBERT J. THOMAS, Minneapolis: I cannot say anything about the operation Dr. Lower has devised for closure of the prostatic space, but I have had some experience with closing the bladder following prostatectomy, removal of tumors of the bladder, and removal of bladder stones. Opening of the bladder has sometimes occurred because of the accumulation of the fluids between the tissue layers. By keeping a gutta percha drain in the space between the bladder and the superficial layers for a number of days, we have overcome this accident. We have reduced the number of cases that have opened up by at least 15 per cent.

DR. BRANSFORD LEWIS, St. Louis: I find myself much in accord with Dr. Chute. It seems to me that the field for this method would be limited, not only because of the need for expertness on the part of the operator, but as related to the patients themselves. In the septic bladder I would hesitate to have it attempted even in the hands of Dr. Lower, for they will almost surely open up. I have tried sewing up the bladder following suprapubic operations and discontinued the practice as unsatisfactory and undesirable. The practice was carried out for a time and discontinued (I think) by Dr. Judd at the Mayo Clinic. The one advantage that might accrue would be shortening the period of convalescence. I would like to hear Dr. Lower mention some individual instances of this when he closes the discussion.

DR. HENRY J. SCHERCK, St. Louis: I was interested in the paper because many years ago this method was brought to our attention and the objections that have been advanced by Dr. Chute and Dr. Lewis were the things that deterred us from going further. It seems to me that if the patient has a hemorrhagic prostatic cavity it would be well to expose the bladder and ligate the bleeding vessels, leaving an open space, as we all do in these cases when hemorrhage cannot be controlled by other means. If it is desired to close the bladder, I see no objection to doing this, with but a small suprapubic catheter drain. The period of convalescence has been much shortened in this way. In the hospital with which I am connected we have had an average stay in the hospital of about three weeks after the second stage. During that period everything possible should be done to build up the patient and keep him in good condition. The thing resolves itself into control of hemorrhage, and I think this can be done very well by visualization and catching of vessels in certain cases, but not complete closure of the bladder or attempt to obliterate the prostatic cavity, as it seems to me it would be impossible to do so throughout the prostatic urethra from which the gland has been removed.

DR. ALEXANDER RANDALL, Philadelphia: I think Dr. Chute is correct. Dr. Lower's manual skill at the operating table is equaled only by his artist in depicting the closure. I do not know how often he sees these big gaping wounds, but I think that it is not the experience of most of us. I wish to criticize the procedure from several points of view: first, one's ability to observe and place the sutures as he has depicted it; second, the advisability of leaving suture material in such an operative field; third, the question of sewing at all through the thin lamina of tissue with the rectum in such close proximity. Whether he gets primary healing I doubt, but a fourth point could be raised that he is forming an artificial sphincter according to his judgment but not according to nature. These critical points are mostly academic, but there is one thing that all urologists have fought for for twenty years, and if everything else was denied us we would hold to it alone; for if there is any one thing that has changed mortality in this type of surgery, that one thing is drainage. We all know what it means in these cases to drain preoperatively, and I think, yes, I positively know, that it will be a great fault to withdraw that drainage postoperatively. We all know that during the period of prostatic hypertrophy an increasing load is put on renal function and the general blood pressure and the heart. We all know that, with preoperative drainage, the blood pressure falls sometimes to an alarming degree and this constitutes the first critical period in the handling of such a case. The operation itself with its dangers of hemorrhage, shock, anesthesia and sepsis forms the second critical period. Then comes the third great danger, and that is the return of positive vesical pressure following fistula closure. When this occurs there naturally returns a higher renal pressure, then a call for higher blood pressure, and this in turn creates a greater call on the cardiac muscle. So it is again from this point of view that I think it would be a great mistake to throw that additional load on the patient's economy immediately following the operative procedure. Of course, I realize that Dr. Lower has provided catheter drainage; but who is there that does not know the uncertainty of this. I will rest content to let so fair-minded a surgeon as Dr. Lower experiment with his operative closure, while giving my own patients competent drainage, and await the verdict of his results.

DR. H. A. FOWLER, Washington, D. C.: We are all interested in any method by which the bladder may be immediately and completely closed following prostatectomy. This pro-

cedure is certainly ideal. Dr. Lower has devised such a method which seems to be successful. In a certain percentage of cases immediate closure of the bladder undoubtedly can be done if hemorrhage can be completely controlled. I have found that hemorrhage in these cases arises from the torn mucous membrane along the line where this passes from the bladder over on to the enlarged gland, the bleeding vessels occurring chiefly at two points, 5 and 7 on the clock dial. These bleeding points can be controlled quite easily by suture. Another point from which hemorrhage occurs is the prostatic bed and is due, I believe, to tearing of the urethral mucosa during enucleation of the gland. This source of bleeding can be controlled only by packing or by a close and accurate approximation of the walls of the prostatic bed by suture. Dr. Lower shows us how this can be done. I am at a disadvantage in discussing Dr. Lower's paper for the reason that I have not had experience with his method. However, I am interested in the technic he describes, which has for its object the making of the suprapubic removal of the prostate a more ideal operation. I am certainly grateful to him for this contribution.

DR. C. W. COLLINGS, New York: A small number of all prostatectomies are followed after a time by scar at the neck of the bladder which produces obstruction. If Dr. Lower sews up the walls of the cavity as tightly as the illustration has shown, then he may have more fibrosis at the bladder neck than with the usual procedure of prostatectomy. I should like to ask how many of the patients had residual urine following prostatectomy, and how the bladder neck appeared cystoscopically one or two months after his operation.

DR. WILLIAM E. LOWER, Cleveland: Dr. Chute did not treat me quite fairly. I am sure if he tried to do this operation he would do it much better than I possibly could. First, as to drainage: In all these cases there is preliminary drainage with indwelling catheters. I have been very careful to use this, and if the patients do not tolerate the catheters, I make a suprapubic puncture, being careful not to make too wide an opening. We can never tell how long the interval between the operations will be. I have never seen harm follow this procedure. I have not yet determined the time that may be saved by this process, but I hope to do this within a short time. I wish to make the series larger and see what happens. I am not saying that this is the final answer, but if we can make a better closure of the bladder and reduce the hemorrhage, it is worth while. As I look back to the old days when we used to put on enormous pads and dressings and hope that the hemorrhage would cease after we put the patient to bed all padded up with cotton, it does seem that considerable progress has been made. I think the best procedure is to stop the hemorrhage at the time of operation, if possible. In all these cases, irrigation is done at the time of operation. I think Dr. Scherck's results must be better than most of us can claim. There is always a good sized cavity there. While the muscle may contract and partly close it, I have seen large stones form in the cavities sometime afterward, and an hour-glass bladder will form unless care is taken. If this can be eiiminated, I think it is important. I have had one case in which there was definite retraction and hemorrhage afterward. In this case the bladder was closed and tied with a small catheter in place. It should be remembered that one has the urethra at the most dependent portion of the bladder, and when the bladder is emptied it is emptied completely. I am not saying that this is the last word, for we never reach a stage at which any operation is absolutely satisfactory; but while great progress has been made in this department, if we can add something more that will shorten the convalescence and lower the mortality that is what we should work for. I see the different objections to this operation and hope to report later just what the shortcomings are.

**Three Fatiguing Products.**—"'It is now customary,' writes Professor Lee, 'to recognize three distinct metabolic products as fatiguing; namely, sarcolactic acid, monopotassium phosphate and carbon dioxide, all of which are acid in reaction.'" —Goldmark: Fatigue and Efficiency, p. 25.

# RADIUM TREATMENT IN NEOPLASMS OF THE UPPER AIR PASSAGES

## PROGRESS AND RESULTS *

G. ALLEN ROBINSON, M.D.
NEW YORK

In this paper I shall discuss the use of radium in fibromas of the nasopharynx, polypoid ethmoiditis, rhinoscleroma and malignant tumors of the sinuses.

### FIBROMAS OF THE NASOPHARYNX

Fibromas of the nasopharynx are dense, firm tumors composed of connective tissue and blood vessels. They occur in early adult life and more often in males than in females. They form a definite clinical picture, but the etiology is unknown. The tumors are usually pedunculated and arise from the vault of the nasopharynx, although they may originate in the posterior

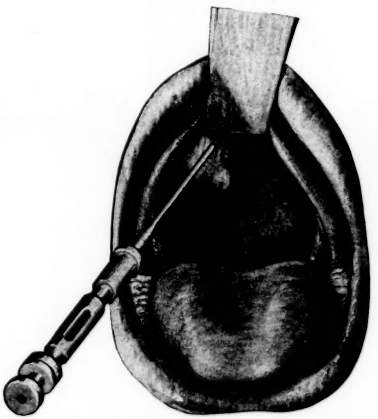


Fig. 1.—Implantation of radon seed in base of fibroma in nasopharynx.

ethmoid or sphenoid sinuses. The surgical treatment of fibromas is attended with severe hemorrhages and frequent recurrences. Radium treatment has been found to be a safe procedure and to give good results. The technic now employed is to apply a 50 mg. radium tube to the pedicle of the growth for six hours in order to shrink the tumor and decrease the blood supply. After two or three weeks, platinum radon seeds are inserted into the tumor mass with little or no danger of hemorrhage. A radiation necrosis of the tumor mass is to be avoided, because of the danger of middle ear infection. In eight patients treated with radium two were successfully operated on after two radium applications, five are clinically cured with radium alone, and one under treatment at the present time is improved.

### POLYPOID ETHMOIDITIS

During the past five years radium has been employed in the treatment of polypoid ethmoiditis by Lyons, Sluder, McCullagh and Robinson, and others with encouraging results. It is well known that surgical

* Read before the Section on Laryngology, Otology and Rhinology at the Seventy-Eighth Annual Session of the American Medical Association, Washington, D. C., May 19, 1927.

procedures alone often fail to cure. Recurrences even after radical operation are frequent. At other times, when a quiescent stage has been reached, an acute cold will cause the mucous membrane to undergo active polypoid growth. Frequent recurrences associated with asthmatic attacks and chronic mucopurulent discharge demanded a search for an agent that would alleviate the symptoms and lessen the incidence of recurrence.

Experience has shown that it is best to apply radium postoperatively in polypoid ethmoiditis. Within a week or ten days following the ethmoidectomy, a 50 mg. radium capsule should be applied to the ethmoid area for from two to four hours and repeated in about two weeks. About one week after the gamma radiation there is a marked congestion of the mucosa, with increased discharge. This inflammatory reaction subsides after a few days and is in proportion to the amount of radiation given. The average number of

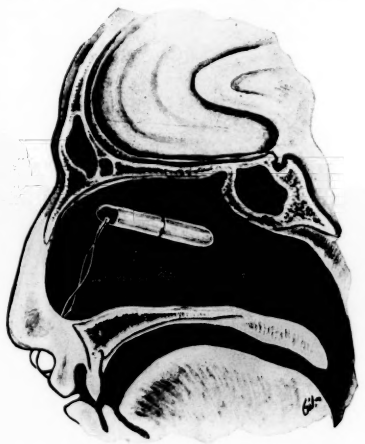


Fig. 2.—Radium capsule applied to ethmoid area.

applications is four. The end-result of the treatment is a fibrous tissue formation in the mucosa and submucosa. A few polypi will recur in most cases, but they are decidedly more fibrous in character.

Experience in nearly forty cases has shown that headaches, chronic nasal discharge and asthmatic attacks have been relieved and that the sense of smell has returned. The interval between recurrences of polypi, as a result of the radium treatments, is lengthened.

### RHINOSCLEROMA

Rhinoscleroma is a chronic inflammatory condition produced by Frisch's bacillus, which gradually causes obstruction of the upper air passages. The action of radium in this condition is to produce dense fibrous tissue replacing the loose granulation fibrillar mesh work in the submucosa. In early cases radium offers a good chance for a cure, and in the advanced cases palliative relief is obtained. In three early cases with the disease localized to the nasal cavities there has been a clinical disappearance of the neoplasm. In three advanced cases the nasal obstruction was relieved for from two to four years.

### MALIGNANT TUMORS OF THE SINUSES

A combination of methods gives the best end-result in the treatment of carcinoma of the antrum. Unfortunately the condition is rarely observed early, and the bony walls are often involved, requiring extensive surgery. Electrocoagulation has been of great value in destroying the mass without hemorrhage or danger of metastasis. After the growth has been removed and the cavity made accessible for radium application, intense gamma radiation is given. Two or three 50 mg. radium tubes screened with 1 mm. of brass may be applied to the region involved for from fifteen to twenty hours. A combination of deep roentgen-ray and radium packs is applied externally over the cheek and to the regional lymphatics. Of seventeen patients with carcinoma of the antrum and accessory sinuses, three have remained clinically free from the disease for more than three years.

Sarcoma of the nasal sinuses is more sensitive to radium treatment than carcinoma. Surgical measures in the treatment of sarcoma of sinuses are best omitted or limited to the removal of a section to determine the type of tumor involved. Deep roentgen-ray therapy plus radium packs will inhibit the growth and in some cases give clinical cures. Of fourteen patients with sarcoma of the antrum treated with radium, two are alive and have been well for five years, one for three years and two for two years.

653 Park Avenue.

## ABSTRACT OF DISCUSSION

DR. THOMAS E. JONES, Cleveland: The only way we can get these antrum cases earlier is by bringing this problem before the dental societies. In every one of my cases from one to six teeth had been pulled, after which there had been a delay of from a month to six months before anything was done. The first symptom is pain along the second division of the fifth nerve, in the cheek and the upper jaw. The pain is called neuralgia. It follows that usually we do not see these cases until the malignant condition had perforated the antrum through either the mouth or the cheek. The pain, of course, may be due to the growth or infection, or both. I think that most of the pain is due to infection, and once infection has developed osteomyelitis follows and the pain becomes very severe. This pain has been handled by various methods. We have used alcohol injections into the infra-orbital foramen and also the foramen alley, but not always with very good results. We have also done neurectomy, but in the advanced cases, in which the infra-orbital canal is involved, the canal does not hold the alcohol; therefore that treatment is worthless, and removal of the nerve is not satisfactory. I believe, on account of the perfected technic and the very good results that follow it, that eventually we shall do a gasserian ganglion operation. We control the hemorrhage by ligation of the external carotid. Recurrences are generally due, I think, to extension along the infra-orbital plate, and this should be removed in all cases in which there is any doubt. I have seen an extension to the lymphatic glands in only one of my cases, and believe that this is not a common occurrence in association with squamous carcinoma of the antrum. It is a common occurrence in cases of sarcoma. In none of my cases has the neck been irradiated externally. Our present method of treatment is to administer colonic ether anesthesia. By this procedure the operation can be completed without stopping to give the patient more anesthetic, and allowing a lot of blood to get into the throat. Thus we are not bothered with tubes in the throat or nose, and can work unhandicapped. We then ligate the external artery in order to control the hemorrhage when the slough comes away, and pack the nasopharynx to keep it clean. We use electrocoagulation. If the disease points on the cheek we go through the cheek. If it points on the mouth over the gum, we enter the antrum through that route.

DR. HOMER DUPUY, New Orleans: Experience has convinced me, in the handling of rhinopharyngeal fibromas and fibrosarcomas in children, of the advisability of controlling the serious and alarming hemorrhages which often occur during the manipulation of such tissue. Even when radium needles are applied I still advocate the preliminary performance of tracheotomy, for the reason that during the application of needles through the nose and behind the soft palate, the bleeding can be effectively controlled by packing the oropharynx. With a tracheal cannula for the air supply, we can work unhampered.

DR. G. ALLEN ROBINSON, New York: The problem arises as to who should apply the radium in these cases. Experience has taught me that it is necessary for one who does this work intelligently to become a specialist in rhinology and laryngology. I agree with Dr. Jones on the radical surgical removal of carcinoma of the antrum, and if the floor of the orbit is involved, the eye on that side should be sacrificed. I have seen two cases of carcinoma of the antrum resulting from extension of basal cell epithelioma of the lower eyelid. I do not believe that preliminary tracheotomy is necessary in the treatment of fibroma of the nasopharynx, but preliminary surface irradiation is indicated in order to shrink the growth before the insertion of radium needles and platinum seeds is attempted.

# PERNICIOUS ANEMIA

## AN EXPERIMENTAL CONTRIBUTION TO THE ETIOLOGY, DIAGNOSIS AND TREATMENT *

DAVID I. MACHT, M.D., LL.B.
Lecturer in Pharmacology, Johns Hopkins University School of Medicine; Director of the Pharmacological Research Laboratory, Hynson, Westcott and Dunning
BALTIMORE

In order to give clearer and more adequate exposition of the present investigation, it is desirable to preface the presentation with a few remarks on general physiology and general pharmacology. Although biology embraces the study of all living organisms and living processes, both of animals and of plants, we medical men have been confining our attention almost exclusively to animals. Our physiology as taught in medical schools and as practiced by medical researchers is for the most part zoophysiology, or animal physiology; and the pharmacology taught in our medical colleges and to which our pharmacologic investigators devote their attention is almost exclusively zoopharmacology, or animal pharmacology. There is, however, a very important department of physiology recognized as phytophysiology, or plant physiology, laboratories for which have been established in many universities. It is surprising, therefore, that in the field of pharmacology, experimental medicine and more particularly experimental therapeutics so little attention has been paid to what may be called plant pharmacology.

For some years I have been interested in the comparative study of the reaction to drugs and poisons of animal and plant protoplasm, and have been endeavoring in this way to contribute even though a very little bit to the subject of what may be termed phytopharmacology, or the influence of drugs and poisons on plant physiologic processes. In connection with such studies, some interesting observations have already been collected. Thus, in the first contribution of the kind published by Macht and Livingston[1] concerning the comparative effects of cocaine and its decomposition products on animal and plant protoplasm, it was found that the two kinds of living organisms, animal and vegetable, reacted very differently to the same chemical compounds. These curious reactions suggested the employment of living plants or seedlings as test objects for poisons which were not particularly toxic for animal preparations except in very large doses. In this way an extensive and intensive study was made of menotoxin, or the poison or toxin found in the various secretions of women at the time of menstruation.[2] Again, in a similar way, Looney and Macht[3] made a study of the blood in various psychoses, obtaining data which pointed to the presence of some toxic substance in the blood which could not be demonstrated by animal experiments.

While engaged in a routine examination of numerous specimens of blood serum in connection with the study of menotoxin, I had the opportunity on one occasion of examining the blood of a patient suffering from pernicious anemia, and was greatly surprised to find that the serum of the patient was extremely toxic for plants, even to a higher degree than most of the toxic samples of menstrual blood that had been examined. Here was apparently an example of a new poisonous substance present in the circulating blood and not menotoxin, for the patient was a man. Accordingly, it was thought advisable to examine other cases of pernicious anemia and other anemias in the same way. Such examinations led to very surprising results which I shall describe in this paper. A preliminary announcement was printed in the Proceedings for Experimental Biology and Medicine and a detailed account of work done up to the winter of 1925 appeared in the festschrift for Professor Abel.[4] In the present paper additional experimental data and new observations are reported.

### METHOD

The method employed was the same as that described in my original papers on cocaine and menotoxin, and was as follows: The toxicity of the normal human blood and of the blood from cases of anemia was studied on intact living seedlings or plants. For this purpose it was found that the seedlings of *Lupinus albus*, which have already been employed by Macht and Livingston in another connection, offered one of the best test objects. Such seedlings were germinated and grown under definite physical conditions, and their growth was studied quantitatively by measuring the elongation of the roots and other changes.

In figure 1 a dry *Lupinus albus* seed and one which has been soaked in water over night and is ready for planting are illustrated. The difference in growth of the two seedlings is shown, one being immersed in normal Shive solution and the other in Shive solution containing 1 per cent of pernicious anemia serum. The marked line of demarcation between the root and the stem is visible, so that the growth can be measured quite accurately.

### MATERIAL EXAMINED

I examined as many specimens of blood from cases of pernicious anemia as it was possible to obtain from

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* From the Pharmacological Research Laboratory, Hynson, Westcott and Dunning.

* Because of lack of space, this article is abbreviated in THE JOURNAL. The complete article appears in the Transactions of the Section and in the author's reprints.

* Read before the Section on Practice of Medicine at the Seventy-Eighth Annual Session of the American Medical Association, Washington, D. C., May 19, 1927.

1. Macht, D. I., and Livingston, M. B.: J. General Physiol. **4**: 573 (May) 1922.
2. Macht, D. I., and Lubin, O. S.: J. Pharmacol. & Therap. **22**: 413 (Jan.) 1924.
3. Looney, J. M., and Macht, D. I.: J. Biol. Chem. **63**: lx (Feb.) 1925.
4. Macht, D. I.: J. Pharmacol. & Exper. Therap. **29**: 461 (Oct. 7) 1926.

the various hospitals and physicians in Baltimore city and in a number of out-of-town clinics. In obtaining the samples, instructions were to draw from 5 to 10 cc. of blood in ordinary Wassermann test tubes without the admixture of any antiseptic or anticoagulant. After the serum separated from the clot, and after the blood had set, the specimens were centrifugalized and the clearer serum was ready for experimentation. Such serums could be kept in an icebox for a number of days without apparent deterioration. In addition to the specimens from cases of pernicious anemia a large number of normal serums were examined as controls, and another series of experiments were made with serums from other blood diseases, such as severe secondary anemia, carcinoma, Hodgkin's disease and various leukemias. These, as will be seen, reacted very differently from true pernicious anemia. In order to eliminate every source of error possible, and more particularly the personal equation in the measurement of specimens, the samples were submitted to me in most cases without the clinical and morphologic diagnosis of the case from which they were obtained, and the data obtained from the phytopharmacologic study were only later compared with the clinical and morphologic observations.

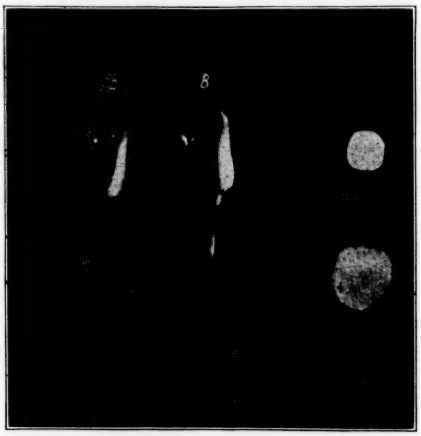

Fig. 1.—Appearance of a dry Lupinus albus seed and one which has been soaked in water over night and is ready for planting. The difference in the growth of the two seedlings is also shown, one being immersed in normal Shive solution and the other in Shive solution containing 1 per cent of pernicious anemia serum. The marked line of demarcation between the root and the stem is visible, so that the growth can be measured quite accurately.

## RESULTS

The results obtained in the first forty-eight cases were studied. The average coefficient of growth in normal blood serum taken from twenty-six samples of blood was found to be 75 per cent, the same as that obtained in previous experiments by Macht and Lubin. On the other hand, the indexes of growth obtained with samples of pernicious anemia blood were very different. It was found that some of these were more toxic than others, the lowest figure obtained being 28 per cent and the highest 51 per cent, giving an average coefficient of pernicious anemia of 44 per cent. This toxicity of the serum for pernicious anemia cases was so marked that it was found very useful in the differential diagnosis of unknown or doubtful cases sent to me by various physicians. When a coefficient of growth was obtained of 50 or less per cent, as compared with a normal serum index of from 70 to 75 per cent, the results spoke in favor of pernicious anemia, and this diagnosis agreed almost in every case with the clinical and morphologic observations in cases in which they could be made. Occasionally, when seeds of an especially large variety were used, the seedlings were a little more hardy, and in such cases pernicious anemia gave an index as high as 55 per cent, while normal blood serum gave 75 per cent. In doubtful cases in which the clinicians were not able to make a positive diagnosis, this phytotoxic test was found helpful in deciding the case. In table 2 are shown the results obtained on phytopharmacologic examination of the blood from other blood diseases, with the exception of menstrual blood. It will be seen that the severe secondary anemias, leukemia, or Hodgkin's disease, did not give as toxic an effect as pernicious anemia serum, and for this reason the plant test could be and was actually used as a help in differential diagnosis. It will be noted in table 2 that the clinical condition known as Hodgkin's disease came nearest in toxicity to that of pernicious anemia. In table 3 are additional data obtained with some recent cases of pernicious anemia, Hodgkin's disease and leukemia. Here, again, the results are the same as those found in the previous experiences. I am at present engaged in collaboration with Dr. E. A. Baumgartner, Clifton Springs Sanitarium, Clifton Springs, N. Y., in the study of a series of cases of sprue as compared with pernicious anemia. The results will be reported in the near future.

## COMMENT

These results seem to indicate fairly conclusively that the blood of patients suffering from pernicious anemia contains some poisonous substance that is not found in normal blood. While there have been various theories in regard to the causation of pernicious anemia, and while many clinicians have been inclined to regard it as due to some unknown poisonous substance, the foregoing is believed to be the first definite experimental scientific demonstration of the presence of such a toxin in this disease. The difference between normal serum and that of pernicious anemia is so striking that I did not have any difficulty in almost every case in diagnosing the latter condition, when unknown samples of blood were submitted to me for examination. Not only could such specimens be distinguished from normal blood serum, but they also behaved quite differently from all the other blood diseases examined, as noted in table 2. The phytopharmacologic examination, therefore, not only has been found useful in demonstrating the toxic etiology of primary anemia but also is of practical aid in the differential diagnosis of that condition.

The hydrogen ion concentration of the serums does not play a rôle in explaining the selective toxicity of the toxin for plants because I have made careful determinations on the subject with the assistance of Mr. W. C. Harden and have not found any appreciable difference in the hydrogen ion concentration between normal blood serums and those from cases of pernicious anemia.

The difference between the serum of pernicious anemia and that of extreme secondary anemias is of especial interest. The secondary anemia serums were

practically nontoxic, although the clinical and morphologic pictures of the blood in these cases were very marked.

### ATTEMPTS AT DETOXIFICATION

Pernicious anemia is universally known as a fatal disease, and all attempts at treatment have so far given only palliative results. In connection with the foregoing

TABLE 2.—*Normal Blood Versus Other Anemias*

| Case Number | Clinical and Morphologic Diagnosis | Coefficient of Growth, per Cent |
|---|---|---|
| 1 | Doubtful pernicious anemia | 56 |
| 2 | Doubtful pernicious anemia | 55 |
| 3 | Doubtful pernicious anemia | 55 |
| 4 | Doubtful pernicious anemia | 58 |
| 5 | Doubtful pernicious anemia | 58 |
| 6 | Sprue, secondary anemia | 60 |
| 7 | Severe secondary anemia | 69 |
| 8 | Severe secondary anemia | 65 |
| 9 | Pellagra, secondary anemia | 70 |
| 10 | Hemolytic jaundice | 74 |
| 11 | Obstructive jaundice | 71 |
| 12 | Carcinoma, secondary anemia | 70 |
| 13 | Mononucleosis | 80 |
| 14 | Banti's disease | 73 |
| 15 | Lymphatic leukemia | 68 |
| 16 | Myelogenous leukemia | 70 |
| 17 | Myelogenous leukemia | 82 |
| 18 | Hodgkin's disease | 60 |
| 19 | Hodgkin's disease | 56 |
| 20 | Hodgkin's disease | 56 |

study of the toxin occurring in the blood of such patients, I attempted various experiments with a view of determining how to detoxify this poison. As I have found that various radiations, and more particularly ultraviolet rays, may detoxify blood in certain cases of poisoning, as for instance in poisoning with carbon

TABLE 3.—*Recent Cases*

| Patient | Diagnosis | Phytotoxic Index, per Cent |
|---|---|---|
| R. | Pernicious anemia | 48 |
| N. | Pernicious anemia | 47 |
| B. | Pernicious anemia | 44 |
| H. | Pernicious anemia | 50 |
| G. | Pernicious anemia | 50 |
| T. | Pernicious anemia | 46 |
| D. | Pernicious anemia | 44 |
| Gr. | Pernicious anemia | 66 |
| Ro. | Pernicious anemia | 47 |
| Cr. | Pernicious anemia | 48 |
| Be. | Pernicious anemia | 41 |
| Wl. | Severe anemia and benzene poisoning | 49 |
| W. | Hodgkin's disease | 61 |
| Wm. | Hodgkin's disease | 61 |
| K. | Sprue | 67 |
| Fi. | Sprue | 75 |
| Lo. | Sprue | 73 |
| Co. | Sprue | 76 |
| Cl. | Sprue amebic dysentery | 71 |
| Pr. | Sprue | 61 |
| Bi. | Sprue | 63 |
| J. | Myelogenous leukemia | 71 |
| A. | Myelogenous leukemia | 71 |
| Nr. | Normal serum | 72 |
| Da. | Normal serum | 75 |
| Ca. | Normal blood but brother has pernicious anemia | 74 |
| Ol. | Normal blood | 75 |
| La. | Not pernicious anemia | 64 |
| Fr. | Secondary anemia | 70 |
| Mc. | Secondary anemia | 75 |
| Pn. | Combined degeneration and anemia | 60 |
| Kb. | Anemia combined sclerosis | 53 |
| Y. | Hemophilia | 70 |

monoxide, various experiments were performed with irradiation of blood serum from pernicious anemia. A sample of toxic serum was obtained, and its phytotoxic index was determined. Another sample of the same serum was then taken, and after dilution with from four to five parts of distilled water, it was exposed to the radiations of an Hanovia alpine sun quartz mercury vapor lamp for fifteen minutes. Examination of the serum after irradiation did not show any coagulation. The sample was then tested on plants, and it was found that it became less poisonous. This experiment was repeated a large number of times, and similar results were obtained. Irradiation with ultraviolet rays produced detoxification of the pernicious anemia serum. In another publication by Macht and Hill,[6] it was shown that after the irradiation of normal blood serum from various animals by ultraviolet rays, the phytotoxic index for *Lupinus albus* is practically unchanged. The striking results obtained with pernicious anemia serum after the irradiations were therefore apparently due to a detoxification or to some other change in the toxin present in such serum.

Table 4 gives some of the results obtained in experiments with ultraviolet irradiation. In all cases some degree of detoxification was produced, as far as could

TABLE 4.—*Effect of Irradiation*

| Specimen | Form of Radiation | Duration, Min. | Distance, Cm. | Phytotoxic Index Before per Cent | Phytotoxic Index After per Cent | Containers | Shortest Wave Length Transmitted, Angstrom Units |
|---|---|---|---|---|---|---|---|
| P. A. No. 1 | Alpine sun | 30 | 35 | 48 | 56 | Quartz tube | 1,850 |
| P. A. No. 2 | Alpine sun | 30 | 35 | 44 | 55 | Quartz tube | 1,850 |
| P. A. No. 3 | Alpine sun | 25 | 35 | 50 | 62 | Quartz tube | 1,850 |
| P. A. No. 4 | Alpine sun | 25 | 35 | 51 | 59 | Quartz tube | 1,850 |
| P. A. No. 5 | Alpine sun | 30 | 35 | 44 | 61 | Quartz tube | 1,850 |
| P. A. No. 6 | Alpine sun | 30 | 35 | 47 | 70 | Quartz tube | 1,850 |
| P. A. No. 7 | Alpine sun | 30 | 35 | 47 | 66 | Quartz tube | 1,850 |
| P. A. No. 7 | Alpine sun | 30 | 35 | 47 | 53 | Pyrex tube | 2,820 |
| P. A. No. 7 | Alpine sun | 30 | 35 | 47 | 47 | Plain glass | 3,000 |
| P. A. No. 7 | Alpine sun | 30 | 35 | 47 | 50 | Cellophane pyrex | |
| P. A. No. 8 | Krohmayer lamp | 30 | 15 | 50 | 66 | Quartz tube | 2,000 |
| P. A. No. 9 | Krohmayer lamp | 30 | 15 | 50 | 60 | Quartz tube | 2,000 |
| P. A. No. 10 | Krohmayer lamp | 15 | 15 | 50 | 58 | Quartz tube | 2,000 |

be judged by the behavior of seedlings before and after exposure of the serum. The table also shows the effect of various containers used in the processes of irradiation.

### EFFECT OF SENSITIZERS

Various investigators have shown that various dyes, especially of the fluorescent type, can act as sensitizers for ultraviolet radiations. Thus, Tappeiner and Jodlbauer[7] found that paramecia when suspended in a solution of a certain dye were rapidly killed on exposure to light but were not affected deleteriously when left standing in the same solution in the dark. Amsler

TABLE 5.—*Effect of Sensitizers*

| Experiments | Forms of Radiation | Duration, Min. | Distance, Cm. | Phytotoxic Index Before, per Cent | Phytotoxic Index After, per Cent | Sensitizer |
|---|---|---|---|---|---|---|
| 1 P. A., serum | Alpine sun | 30 | 35 | 44 | 55 | None |
| 1 P. A., serum | Alpine sun | 30 | 35 | 44 | 64 | E 1:100,000 |
| 1 P. A., serum | Not irradiated | .. | .. | 44 | 44 | E 1:100,000 |
| 2 P. A., serum | Krohmayer lamp | 30 | 15 | 50 | 66 | None |
| 2 P. A., serum | Krohmayer lamp | 30 | 15 | 50 | 70 | E 1:100,000 |
| 2 P. A., serum | Not irradiated | .. | .. | 50 | 51 | E 1:100,000 |
| 3 P. A., serum | Krohmayer lamp | 25 | 15 | 50 | 58 | None |
| 3 P. A., serum | Krohmayer lamp | 25 | 15 | 50 | 53 | F 1:100,000 |
| 3 P. A., serum | Krohmayer lamp | 25 | 15 | 50 | 62 | E 1:100,000 |
| 3 P. A., serum | Krohmayer lamp | 25 | 15 | 50 | 70 | Y 1:100,000 |
| 3 P. A., serum | Krohmayer lamp | 25 | 15 | 50 | 50 | R 1:100,000 |
| 4 P. A., serum | Alpine sun | 30 | 35 | 48 | 56 | None |
| 4 P. A., serum | Alpine sun | 30 | 35 | 48 | 46 | U 1:100,000 |
| 5 P. A., serum | Diffuse sunlight | 1 hour | .. | 50 | 60 | H 1:100,000 |

6. Macht, D. I., and Hill, E. C.: J. General Physiol. **6**: 671 (July) 1924.

7. Von Tappeiner, H., and Jodlbauer, A.: Ergebn. d. Physiol. **8**: 698, 1909.

and Pick [8] and Kolm and Pick [9] found that eosin has a toxic effect on certain pharmacologic reactions when exposed to ultraviolet rays, and yet is not toxic in the dark. In studying the effect of sun rays and ultraviolet radiation on the growth of yeast in various fluorescent solutions, I found that the inhibitory effect of ultraviolet radiations on the growth of yeast is greatly potentiated by the presence of various derivatives of fluorescein.[10] I also found that while certain dyes increased the potency of ultraviolet rays, other dyes, by absorbing them, render the same rays less efficient. Thus, for instance, when a small quantity of esculin solution is added to a suspension of yeast in sugar water, the inhibitory effect of ultraviolet rays on yeast is no longer produced. On the other hand, the addition of eosin renders the same rays very much more effective in inhibiting the growth of yeast.[11] In connection with these experiments on irradiation of serums from cases of pernicious anemia, I experimented with a number of dyes as sensitizers, and found that some of them rendered the detoxifying effects of the mercury lamp radiations much more pronounced. These experiments are still in progress, but some of the results obtained are exhibited in table 5. The various dyes are symbolized by different letters of the alphabet. Thus, it will be noted that the addition of 1,100,000 parts of E, which is tetrabromfluorescein, potentiates markedly the effect of the ultraviolet rays, whereas the addition of the same dyes in the dark does not produce any change. Similarly, it was found that a number of other fluorescein derivatives, F, Y and P, also produced more or less potentiation. These compounds were the sodium salt of fluorescein and chlorinated fluorescein derivatives, respectively. It is interesting to note that of the two chlorinated fluorescein compounds that were examined, each behaved very differently. In cases of P, in which the chlorine was introduced into the phthalic radical, the potentiation was very pronounced, whereas in the case of R with the chlorine in the resorcin nucleus, the potentiation was nil. In the case of the interesting glucoside esculin (U), the same phenomenon was noted as in the experiments with yeast. The esculin evidently absorbed all the ultraviolet radiations and thus diverted the destructive effect of the rays on the other substances present in the serum. Some interesting experiments are at present being carried on with certain blood pigments, especially with hematoporphyrin. These are still in a primary stage, but it may be stated even at this time that hematorporphyrin acts as a powerful sensitizer, as exemplified by experiment H at the bottom of the table. Further data will be published in due time.

### THERAPEUTIC OBSERVATIONS

The phytopharmacologic test has been useful not only as a means of demonstrating the toxic properties of pernicious anemia serum and as an aid in differential diagnosis of that condition from other blood diseases, but also as a suitable criterion for the evaluation of different methods of treatment of that disease. Through the kind cooperation of various clinicians I have had the good fortune of securing samples of blood from patients with pernicious anemia, and testing them from time to time in the beginning and during the course of treatment. In this way, a considerable amount of information has already been collected. I wish to emphasize here my great indebtedness to those clinicians who have made such a study possible. The results of the examinations of such samples are set forth in table 6.

(*a*) *Effect of Transfusion.*—Three cases were studied in regard to the effect of blood transfusion in pernicious anemia, a logical procedure widely employed by all clinical men. In case 2 it will be noted that an examination of the blood on the day after transfusion gave an index of 70 per cent, or practically normal plant growth. Cases 3 and 4 showed the results obtained a little later; in these cases, blood specimens were obtained about a week after the transfusion was done. It will be noted that the serums still showed a very high toxicity, thus indicating that the transfusions do not permanently or for any length of time eliminate the toxic substance responsible for the inhibition of plant growth.

(*b*) *Liver Diet.*—Through the work of Minot and Murphy,[12] Murphy, Monroe and Fitz [13] and others, a diet rich in liver substance has been extensively employed during the last year or two for the treatment of pernicious anemia. The results obtained as described by these authors were very gratifying. The patients improved in their subjective and objective symptoms, and their blood pictures also showed a marked improvement in cell count and hemoglobin. I succeeded in securing specimens from a number of cases treated with liver. Nine such cases are listed in table 6, together with the blood reactions after the treatment had been carried on for a number of weeks. It will be noted that the results of such dietetic treatment are interesting. In some cases, as in cases 7, 8, 9 and 12, a marked decrease in the toxicity of the blood was noted, and in case 12 the blood reacted like normal blood. The reactions in some of the other cases, however, as may be seen from a study of the table, were not so marked, and the blood serum of the patients even after a prolonged liver diet showed on repeated examinations a marked toxicity.

(*c*) *Effect of Ultraviolet Irradiation.*—I have already called attention to the laboratory experiments which indicated that irradiations of pernicious anemia serum in quartz tubes with ultraviolet rays rapidly reduced the toxicity of such serums, and I also noted that this detoxifying effect of ultraviolet rays could be intensified by the addition of various sensitizers, such as tetrabromfluorescein. It was, therefore, very desirable to inquire into the effect of ultraviolet irradiations on patients suffering from pernicious anemia. Consequently, I urged various colleagues to try such a form of treatment, first, because of the interesting laboratory experiments and, secondly, because, unlike roentgen-ray or radium treatment, ultraviolet irradiations are not dangerous even in inexperienced hands. Furthermore, sunlight has always been regarded as beneficial in the treatment of all kinds of anemias, and lastly, through the work of Macht, Bell and Elvers,[14] it has been shown that even the invisible ultraviolet rays are more penetrating through the animal tissues than has been heretofore supposed. It was therefore with great gratification that I learned that such ultraviolet therapy or heliotherapy was being employed in the Cincinnati General Hospital under the direction of Prof. G. J. Heuer. Through the courtesy of Professor Heuer I was enabled to obtain several specimens of

8. Amsler and Pick: Arch. f. exper. Path. u. Pharmakol. **82:** 86, 1918.
9. Kolm and Pick: Arch. f. Exper. Path. u. Pharmakol. **86:** 1, 1920.
10. Macht, D. I.: Proc. Soc. Exper. Biol. & Med. **23:** 638 (May) 1926.
11. Macht, D. I.: Proc. Soc. Exper. Biol. & Med. **23:** 639 (May) 1926.
12. Minot, G. R., and Murphy, W. P.: Treatment of Pernicious Anemia by Special Diet, J. A. M. A. **87:** 470-476 (Aug. 14) 1926.
13. Murphy, W. P.; Monroe, R. T., and Fitz, Reginald: Changes in Blood in Pernicious Anemia Treated by a Diet Rich in Liver, J. A. M. A. **88:** 1211 (April 16) 1927.
14. Macht, Bell and Elvers: Proc. Soc. Exper. Biol. & Med. **23:** 210, 1925.

blood from patients who have been subjected to ultraviolet ray radiations from a high intensity carbon arc lamp. Cases 14 to 17 in table 6 exhibit the results obtained on examination of such blood. It will be noted that in each case a marked decrease in the toxicity of the blood specimen was noted, as compared with the evaluation figure (— 50 per cent) obtained during routine examinations of pernicious anemia serum.

*(d) Effect of Ultraviolet Rays Plus Sensitizers.*—A number of cases of pernicious anemia were treated at my suggestion by Dr. E. A. Baumgartner at Clifton Springs, N. Y., with the mercury vapor quartz lamp, simultaneously with the administration of eosin or tetrabromfluorescein. The eosin was administered in some cases by mouth; in other cases by intravenous injection (20 or more milligrams per dose). I was

TABLE 6.—*Therapeutic Experiments*

| No. of Cases | Name | Place | Physician | Clinical Diagnosis | Diagnostic Test | Treatment | Therapeutic Test | Comment |
|---|---|---|---|---|---|---|---|---|
| 1 | B. | Wisconsin | Dr. Evans | Pernicious anemia | 48% | | | |
| 2 | An. | Baltimore | Dr. B. | Pernicious anemia | (—50%) | Transfusion | 20% | Specimen taken day after treatment, February 26 |
| 3 | Tl. | Baltimore | Dr. Rowe | Pernicious anemia | 41% | Transfusion | 50% | Very toxic on repeated examination |
| 4 | Gr. | Clifton Springs | Dr. Baumgartner | Pernicious anemia | (—50%) | Transfusion | 50% | One week after |
| 5 | Mi. | Baltimore | Dr. Rowe | Pernicious anemia | (—50%) | Liver diet | 55% | Two weeks |
| 6 | De. | Baltimore | Dr. Heathe | Pernicious anemia | (—50%) | Liver diet | 52% | Average of 53%, 52%, 51%, 57%, 3 weeks |
| 7 | Bu. | Baltimore | Dr. Heathe | Pernicious anemia | (—50%) | Liver diet | 64% | Average of 60%, 65%, 61%, 4 weeks |
| 8 | Br. | Baltimore | Dr. Heathe | Pernicious anemia | (—50%) | Liver diet | 60% | Four weeks |
| 9 | Da. | Baltimore | Dr. Heathe | Pernicious anemia | (—50%) | Liver diet | 60% | Four weeks |
| 10 | Ha. | Baltimore | Dr. Heathe | Pernicious anemia | (—50%) | Liver diet | 49% | Six months |
| 11 | Do. | Clifton Springs | Dr. Baumgartner | Pernicious anemia index 1, achylia January 17 | 46% | Liver diet, eosin and quartz | April 57% | (Normal blood count now) after 2½ months |
| 12 | St. | Clifton Springs | Dr. Baumgartner | Pernicious anemia February 13 | 58% | Liver diet | April 19, 72% | (Normal blood count now) after 2 months |
| 13 | Ca. | Clifton Springs | Dr. Baumgartner | Pernicious anemia | (—50%) | Liver diet | 72% | |
| 14 | Fr. | Cincinnati | Dr. M. | Pernicious anemia | (—50%) | Carbon arc lamp | 67% | Total hours of irradiation 97 |
| 15 | Sm. | Cincinnati | Dr. M. | Pernicious anemia | (—50%) | Carbon arc lamp | 71% | Total hours of irradiation 596 |
| 16 | Wi. | Cincinnati | Dr. M. | Pernicious anemia | (—50%) | Carbon arc lamp | 63% | Total hours of irradiation 47 |
| 17 | Pr. | Cincinnati | Dr. M. | Pernicious anemia | (—50%) | Carbon arc lamp | 67% | Total hours of irradiation 194 |
| 18 | Cr. | Clifton Springs | Dr. Baumgartner | Pernicious anemia or sprue (?) January, 1927 | 39% | Eosin by mouth, ultraviolet rays, no liver diet | Feb. 48%<br>March 60%<br>April 61%<br>April 59% | Progressive improvement |
| 19 | Ca. | Clifton Springs | Dr. Baumgartner | Pernicious anemia January, 1927 | (—50)% | Ultraviolet rays, intravenous eosin, no liver diet | Feb. 65%<br>April 71%<br>April 65% | |
| 20 | De. | Clifton Springs | Dr. Baumgartner | Pernicious anemia February | (—50%) | Liver diet, eosin by vein, quartz lamp | March 60%<br>April 74% | Apparently complete recovery (?) |
| 21 | Br. | Clifton Springs | Dr. Baumgartner | Pernicious anemia February, 1926, Jan. 10, 1927 | 44%<br>(—50%) | Eosin by mouth, ultraviolet rays, liver diet | Jan. 61%<br>Feb. 75%<br>March 72% | Marked improvement, subjective and objective |
| 22 | Ky. | Clifton Springs | Dr. Baumgartner | Pernicious anemia | (—50%) | Liver diet, eosin, ultraviolet rays | 67% | Improvement, 3 weeks |
| 23 | Kn. | Iowa | Dr. McL. | Pernicious anemia | (—50%) | Injection of mercurochrome | 60% | Marked improvement in symptoms |
| 24 | Wa. | Iowa | Dr. McL. | Pernicious anemia | 55% | Injection of mercurochrome | 64% | |
| 25 | To. | Iowa | Dr. McL. | Pernicious anemia | (—50%) | Injection of mercurochrome | Jan. 63%<br>Feb. 75% | Apparently complete recovery |
| 26 | Kr. | Iowa | Dr. McL. | Pernicious anemia | (—50%) | Injection of mercurochrome | 70% | Was a hopeless case; now in good shape |
| 27 | D. | Iowa | Dr. Vernon | Pernicious anemia February 21 | 52% | Repeated injection of mercurochrome | March 72% | Marvelous improvement |
| 28 | Ba. | Clifton Springs | Dr. Baumgartner | Pernicious anemia | 48% | | | |
| 29 | Fo. | Clifton Springs | Dr. Baumgartner | Neurologic combined degeneration, January 17 | 63%<br>59%<br>57% | ..... | .... | Progressive deterioration |
| 30 | Du. | Clifton Springs | Dr. Baumgartner | Pernicious anemia | 62% | ..... | .... | Progressive deterioration |
| 31 | Ca. | Clifton Springs | Dr. Baumgartner | Pernicious anemia or cancer (?) February 13, neurologic symptoms March 22, pernicious anemia picture April 1 | 58% | | | |
| 32 | Bs. | Clifton Springs | Dr. Baumgartner | Pernicious anemia achylia | 51% | Eosin intravenously, ultraviolet, no liver diet | 62% | In three weeks |

With the permission of Professor Heuer I quote the following information from a letter which he wrote to me:

> With regard to pernicious anemia, we have been treating a series of cases with a carbon arc lamp, which we have devised and assembled here. The results of the treatment of pernicious anemia by radiation have been encouraging, but it is too soon as yet to make any definite statements. The patient we have had longest under observation is one who has been discharged for over a year, and who has not yet had any evidence of relapse. She was bedridden, and had definite cord symptoms, which are found in anemia. A few others have gone for several months, but whether or not they will have a relapse, I do not know.
>
> There is one thing that seems quite certain, on a basis of fifteen cases studied, and that is, under radiation alone, the red blood cell count and hemoglobin tended to come back to normal, and the symptoms are improved.

encouraged in administering eosin by the experiences of György and Gottlieb,[15] who found that through the administration of eosin to infants the curative effects of ultraviolet rays in rickets were greatly intensified. In order to give the patients the benefit of the best treatment that could be thought of, they were also given in most cases a liver diet. The results obtained as indicated by the plant test are seen in cases 18 to 21. It will be noted that in all the cases a definite improvement was obtained, as indicated by the lesser toxicity of the serum, and this improvement went hand in hand with an amelioration in the clinical symptoms.

Case 18 is one of long standing which was diagnosed clinically and morphologically as sprue; but the toxicity of the serum was very different from that in a large

15. György, P., and Gottlieb, K.: Klin. Wchnschr. **2**: 1302 (July 9) 1923.

number of sprue cases that I examined, and spoke in favor of the case being one of pernicious anemia. This patient was given eosin by mouth with ultraviolet irradiations. In cases 19 and 22 the eosin and quartz lamp treatment was given together with the liver diet, so that the improvement in the blood picture and the decrease in the toxicity of the serum is more difficult to account for. However, on comparing the results obtained in these cases with those in cases on the liver diet alone, on the one hand, and the carbon arc lamp cases, on the other hand, it would seem that this combined treatment was more effective than either the liver diet alone or the ultraviolet irradiations alone.

The explanation of the remarkable results obtained with the liver diet and pernicious anemia has been a puzzle to those working in that field, and various theories have been proposed to solve the riddle. Thus, it has been suggested by the work of Simmonds, Becker and McCollum [16] that the presence of iron together with the presence of vitamins which are specifically related to iron assimilation may be the explanation for the therapeutic power of the liver diet in pernicious anemia. It seems to me that perhaps another suggestion in this connection may be made. The liver is a rich storehouse for blood pigments. Now in view of the experiments already described in connection with the effects of sensitizers on the absorption of ultraviolet rays, it might be possible that some of these pigments may help increase the effectiveness of light in this disease. This may be especially true of hemataphorphyrin, which has been shown by various investigators to be a powerful sensitizer not only for the invisible ultraviolet but even for the longer and visible sun rays. I do not have any definite proof in support of this hypothesis but merely offer this explanation as a suggestion to be followed up in later work.

The interesting results obtained with sensitizers open up a promising field for experimental therapeutic investigation. The question arises why or, more scientifically speaking, how ultraviolet irradiation with and without sensitizers produces weakening of the toxin. As definite knowledge of the chemical nature of the toxin of pernicious anemia is still lacking, only speculations can be made on the subject, and this is not worth while at the present time. It is, however, well to note that, in a recent publication by Harris [17] concerning the action of light on blood, it was shown that under certain conditions ultraviolet rays cause plasma to take up oxygen in very considerable quantities. It has also been shown by H. sman [18] and Gaffron [19] that various dyes and blood pigments act as powerful sensitizers for light in this connection. This, of course, is of great interest in relation to the present experiments.

(*c*) *Effect of Organic Mercurials.*—In two short papers published in 1925 and 1926, Dr. P. B. McLaughlin [20] of Sioux City, Iowa, reported certain interesting and rather extraordinary results obtained by him in the treatment of pernicious anemia by means of the intravenous injection of oxymercurydibromfluorescein, or mercurochrome-220 soluble. He found that after repeated injections of this drug the patients improved both in their symptoms and in their physical conditions, and also exhibited a definite improvement in their blood picture.[21] The motive for the initiation of this treatment was the theory that pernicious anemia is due to an infection, probably from the gastro-intestinal canal, and that therefore chemotherapeutic procedures were logically indicated.

A shorter report of four cases by Dr. H. S. Fist,[22] however, is not as favorable as the results reported by Dr. McLaughlin, as out of four cases treated by Fist with mercurochrome injections two patients died without being benefited by the treatment, while two others were "possibly" benefited. Although as a pharmacologist I have always been skeptical about the therapeutic use of intravenous injections of any mercurials, even when in the form of a firm organic compound, the recent publications of Redewill,[23] Potter and Garrison [24] and others,[25] who have given intravenous mercurochrome injections to more than a thousand patients without any harmful results, and indeed with a large number of favorable therapeutic results in genito-urinary infections, have made it worth while to inquire into the value of mercurochrome injections in pernicious anemia. Through the courtesy of Dr. McLaughlin I was able to examine a number of specimens of blood from patients in whom pernicious anemia had been definitely diagnosed clinically and microscopically, and who were given intravenous injections of mercurochrome. The results obtained were very different from what I expected. It was found that hand in hand with the improvement in the clinical picture described by the clinicians there was also a detoxification of the blood serums as determined by the phytopharmacologic test. A most striking example of this is case 27, submitted to me by Dr. F. G. Vernon of Iowa.

### COMMENT

The present investigation must be still regarded as in the experimental stage. The results already in hand, however, are extremely interesting and warrant further work on the subject. I have shown by testing the effect of different serums on the growth of seedlings that a distinct toxicity can be demonstrated in cases of serums from pernicious anemia cases, and thus a step toward the elucidation of the etiology of this grave disease has been made. By applying the phytopharmacologic test to the examination of various specimens of blood, a helpful means of differential diagnosis has been found in connection with the cases so far studied. Finally, by using the phytotoxic index as a criterion, the effect of various forms of treatment has been followed in a limited number of cases. I wish to call attention to the fact that the phytopharmacologic methods of studying serums and various toxins require considerable training in plant physiologic methods as well as in pharmacologic methods. While the description of the test may appear comparatively simple, in actual practice a good deal of experience is required in order to get reliable results. The seedlings must be selected with special care, and preferably must not show too great a variation in length to start with. The germination of the seeds must be carried out in a proper medium and at a proper temperature. The tests on the seedlings must be performed in carefully prepared nutrient solutions, and when the test with the serums is made, the seedlings must be etiolated or kept in the dark, as light may affect the toxicity of the serum. Here, again, the temperature should not be too high.

16. Simmonds, Nina; Becker, J. Ernestine, and McCollum, E. V.: The Relation of Vitamin E to Iron Assimilation, J. A. M. A. **88:** 1047 (April 2) 1927.
17. Harris, O. T.: Biochem. J. **20:** 271, 1926.
18. Hausman: Biochem. Ztschr. **30:** 276, 1911.
19. Gaffron: Naturwissensch. **13:** 41, 1925.
20. McLaughlin, P. B.: J. Iowa M. Soc. **15:** 313 (June) 1925.
21. McLaughlin, P. B.: J. Iowa M. Soc. **16:** 58 (Feb.) 1926.
22. Fist, H. S.: J. Iowa M. Soc. **16:** 310 (July) 1926.
23. Potter, J. E., and Redewill, F. H.: U. S. Nav. M. Bull. **24:** 279 (April) 1926.
24. Redewill, F. H.; Potter, J. E., and Garrison, H. A.: J. Urol. **16:** 397 (Nov.) 1926.
25. Molina and Amil: Rev. méd. cubana, Feb. 27, 1927, p. 1.

The test should be performed on a series of seedlings, and the average increment in growth utilized in calculating the indexes of pathologic growth. When the results are doubtful, it is advisable to repeat the experiments two or three times.

In regard to the results obtained concerning the various methods of treatment, a comparative study of the figures so far on hand indicates that all methods of treatment are followed by more or less improvement, for various periods of time. It would seem, however, that the most promising procedures are liver diet, and irradiation with ultraviolet rays plus the use of innocuous sensitizers, such as tetrabromfluorescein or eosin. Perhaps the most desirable method of treatment would logically be a combination of the two, and this, in fact, in the limited number of cases studied, gave the greatest decrease in the toxicity of the serums, and also the most rapidly attained results. A statement, of course, cannot be made as yet that any of these methods effect permanent cures, any more than such assertions can be made by the advocates of any other form of treatment. However, a temporary improvement in the conditions of the patients or a remission for considerable length of time has been noted by the clinical men who have supplied the samples, and for this reason these newer forms of treatment must be also regarded as a step forward in the right direction. I would say with Epictetus: "If they who find some faults in it were as intimate with it as I am, they would find a great many more." No claim whatever is made to a solution of the pernicious anemia riddle, but if new lines of inquiry have been suggested which give some promise of hope the labor so far expended has not been in vain.

SUMMARY

1. A phytopharmacologic examination of blood serum from cases of pernicious anemia shows that such serum is very toxic for plant protoplasm, and thus suggests a toxin as the etiologic factor in the disease.

2. This phytotoxic property of pernicious anemia serum is not shown by blood specimens from various other blood diseases, and is in this way useful as an aid in the differential diagnosis of this condition.

3. Irradiations of the pernicious anemia serum with ultraviolet rays in quartz containers renders the serum less toxic, and that effect can be increased by the addition of certain phytodynamic sensitizers in the laboratory.

4. The phytotoxic reaction has been used in following a limited number of cases under various forms of treatment, and the decrease in toxicity was found to be unparallel to the improvement in the general condition of the patient; as a result of such a study the value of certain newer forms of therapy has been weighed.

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**Exercise and Relaxation.**—Vigorous physical exercise is undoubtedly good in many cases. It brings a large appetite and vigorous respiration and circulation, but there are times when the rate at which the physical machine is consuming fuel ought to be controlled and kept within very moderate limits. Rest is quite as essential as exercise, and in many cases the adjustment of rest to physical work is much more important than the insistence upon exercise which carries one away from his ordinary routine. Why should not the center of attention in the physical education department be not exercise and more exercise but the use of exercise and relaxation as devices for keeping oneself in condition to meet the emergencies of life?—Judd: Physical Education and Other School Subjects, *Am. Physical Education Rev.*, November, 1919, p. 430.

# A DIET RICH IN LIVER IN THE TREATMENT OF PERNICIOUS ANEMIA

## STUDY OF ONE HUNDRED AND FIVE CASES*

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AND
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BOSTON

A year ago we reported on the beneficial effect of a diet rich in liver for forty-five patients with pernicious anemia.[1] During the year, Brill,[2] Sappington[3] and Barach[4] have reported in confirmation of our results, and Koessler, Maurer and Loughlin[5] and Elders[6] have likewise emphasized the importance of a diet in the treatment of this disease. Our purpose in this paper is to record further observations on our original patients who have continued to take the diet for from about one to three years, and to add information concerning sixty others, or a total of 105. We will discuss the nature of the effective material and its mode of action.

Some of the observations on the 105 patients have been made by other physicians, and we are indebted to them for furnishing us with data. Of the total 105, ninety were placed on the diet at a time when the counts of their red blood corpuscles were below 2,700,000 and averaged 1,480,000 per cubic millimeter, and the other fifteen commenced the diet when their red blood cell counts were above 2,800,000 per cubic millimeter.

In almost all instances the response to feeding liver was prompt, and the patients rapidly became better. Their blood has remained, with the few exceptions noted below, in very satisfactory condition. All the patients are living except three. One died from an unknown cause about four months after commencing the diet, with marked degeneration of the spinal cord. His red blood cell count was 4,300,000 per cubic millimeter a month before death. Another, whose blood had improved less than that of any other patient in the series, died at the age of 71 from cerebral thrombosis fifteen months after he began with the diet. The third patient, after eating liver daily for two years, was killed in an automobile accident. Her red blood cell count had risen promptly and remained above 4.5 million per cubic millimeter to the time of the last count, made two weeks before her death.

### THE BLOOD IN THE FIRST SIX MONTHS AFTER THE DIET WAS BEGUN

The earliest response to the feeding of liver on the part of red blood cells is the appearance of a temporary, often marked increase of reticulocytes. This sign is rarely absent and then only under special circumstances. The increase of reticulocytes occurs within a few days and before there is a definite rise in the number of red blood corpuscles.

The accompanying chart is based on data for the ninety patients whose red blood cell counts were below

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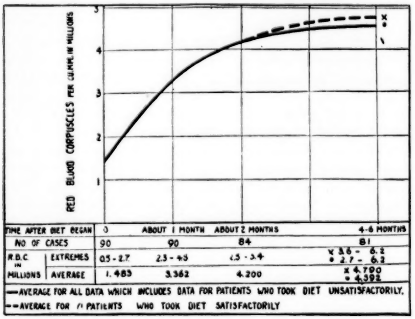
2.7 million per cubic millimeter. It indicates the average rate at which the numbers of corpuscles increased, and the levels to which they rose after the liver diet had been taken regularly. No distinction has been made between cases that had relapsed once and those that relapsed several times. This seemed justified because it had been shown [7] that no matter in what relapse the diet is started there is little difference in the rate at which




Average increase of red blood corpuscles in ninety cases of pernicious anemia treated by a diet rich in liver.

the red blood cells increase or the height to which they rise.

If we consider separately the group of patients who were the most satisfactory from the point of view of the amount of liver taken, the rate and extent of increase of the red blood cells is distinctly above the average for all. It has not been rare to observe an increase of the red blood cell count from about a million to somewhat over 3 million per cubic millimeter within three weeks. There were, on the other hand, patients whose blood improved unusually slowly, and not apparently because little liver was taken.

The remaining fifteen of the 105 patients were placed on the diet when their red blood cell count was relatively high—that is, between 2.8 and 3.8 million per cubic millimeter, and averaged 3.29 million per cubic millimeter. The rate and amount of increase in these cases were similar to those of the other ninety patients after their counts had reached similar levels.

The rise of corpuscles in amount and rate has outstripped the accompanying rise in the concentration of hemoglobin. The initial high color index fell as the cells increased, so that when the count became high this index as a rule was less than one and sometimes below normal. The higher indexes have been associated usually with the cases that have done the least well. Coincident with a red blood cell increase above approximately 4.5 million per cubic millimeter, their average diameter and volume often had become normal and sometimes even less than normal.[8]

As in other cases of pernicious anemia undergoing satisfactory remissions, the effects of eating liver were apparent not only in the red blood cells but also in the other formed blood elements derived from the marrow. The total number of circulating white blood corpuscles increased, sometimes to well above normal, with an increased percentage of bone marrow leukocytes. They began to rise at about the same time as the reticulocytes; and coincidentally or slightly later the blood platelets likewise increased, rapidly approaching, and even exceeding, normal. Within a few weeks after the diet was begun, the polymorphonuclear eosinophils occasionally increased to beyond 20 per cent, this increase persisting for many weeks.

Accompanying the rise of the red blood cells, the excess of bile pigments in the plasma rapidly decreased, so that often within three weeks the icterus index had become less than that commonly observed in normal persons.

### THE BLOOD FROM SIX MONTHS TO THREE YEARS AFTER THE DIET WAS BEGUN

The ultimate effect of continuously feeding liver or something contained in it, together with an adequate diet, can be determined only in the future. But it has already been ascertained that the benefit derived from such treatment is not limited to a few months. Information is at hand concerning all of the fifty-two patients who have taken the diet for a year or more. Twelve of them have taken it for about two years or longer, and two of these for as long as three years. Data concerning their red blood corpuscle counts are presented in the table.

Inspection of this table, which appears below, shows that to date when the diet, primarily liver, has been taken persistently and satisfactorily, the average red blood corpuscle count has remained above 4.5 million per cubic millimeter. It likewise shows that if the diet is inadequate the counts may fall or remain low; but rarely have they returned to as low a level as that found prior to the diet. On the other hand, there are some patients who are recorded as having taken the diet satisfactorily who took little liver for periods of weeks but whose counts either did not fall or fell only slightly. Omission of the diet does not necessarily result in a fall of the count, but in almost all of the few instances in which it has returned to below 4 million per cubic millimeter, liver has been omitted or has been taken very sparingly in the preceding weeks.

THE RED BLOOD CORPUSCLES OF PATIENTS WITH PERNICIOUS ANEMIA WHO HAVE TAKEN DIET FOR ONE YEAR OR LONGER

| TIME (APPROX.) AFTER DIET BEGUN | | 6 MONTHS | | 1 YEAR | | 1½ YEARS | | 2 YEARS | | 3 YRS. |
|---|---|---|---|---|---|---|---|---|---|---|
| WAY DIET WAS TAKEN | | WELL | POORLY | WELL | POORLY | WELL | POORLY | WELL | POORLY | WELL |
| NO. OF CASES | | 42 | 10 | 44 | 8 | 20 | 3 | 11 | 1 | 2 |
| R.B.C. IN MILLIONS | EXTREMES | 3.9 to 6.0 | 2.3 to 3.7 | 3.6 to 6.3 | 2.5 to 3.9 | 4.0 to 5.4 | 3.0 to 3.5 | 4.2 to 4.8 | 3.5 | 4.5 to 5.1 |
| | AVERAGE | 4.73 | 3.24 | 4.68 | 3.36 | 4.72 | 3.23 | 4.62 | 3.5 | 4.80 |
| TOTAL AVERAGE | | 4.44 | | 4.47 | | 4.50 | | 4.52 | | 4.80 |

THE CONDITION OF ALL CASES IS KNOWN AND RECORDED. THE DIFFERENCE IN THE NUMBER OF CASES AT DIFFERENT PERIODS IS DUE TO THE FACT THAT SOME PATIENTS BEGAN THE DIET ONE YEAR AGO AND OTHERS TWO YEARS AGO, ETC.

Slow improvement or low counts after high ones have been established by the diet can be attributed more often to an insufficient liver diet than to any other cause. Failure to take enough liver has usually been due to poverty or stupidity and very rarely to stubbornness. Infection, or other complications of one sort or another, may also account for a low level of the red blood corpuscles. In a very few cases only has there been an unsatisfactory response to adequate liver feeding. Such cases will be referred to separately.

### DECREASES OF RED BLOOD CELLS AFTER THEY HAD RISEN ABOVE FOUR MILLION PER CUBIC MILLIMETER

Not all low red blood cell counts that have been observed enter into the data of the table, as at the times recorded certain counts had risen from lower levels. Even so, among all the cases, after the counts had once risen, considerable decreases have been few and these are described farther on.

In six of the thirty-eight patients who commenced the diet when their red blood cell count was distinctly low and who have taken the diet for less than a year, the count fell from about 4 million to between 3 and 3.5 million per cubic millimeter. In two instances the decline was chiefly associated with infection, and in four it seemed dependent on inadequate diet. All but one of these six patients are now improved, and in four the count has risen to more than 4.4 million per cubic millimeter. In none of the fifteen patients who commenced the diet with relatively high counts have these returned below 4.3 million per cubic millimeter.

Among the forty-two patients recorded in the table as having taken the diet satisfactorily in the first six months, there are three whose red blood cells temporarily dropped within the next six months to about 3.5 million per cubic millimeter. This was associated with a diminished amount of liver in the diet; when these patients again took large amounts, their counts rapidly rose and were over 4.4 million per cubic millimeter within a year after the diet had been begun. Two patients suffered from a marked relapse after regaining a normal level of red blood cell corpuscles. In one of these the relapse occurred in the course of the second six months after the diet was begun, at a time when liver had not been consumed for about two months. In this patient, the count then rapidly fell from over 4 million to 1.9 million per cubic millimeter, and on resumption of the diet rose in six weeks to 5 million per cubic millimeter. The other case of relapse will be referred to subsequently.

A man symptomatically well has apparently taken the diet satisfactorily for a year; yet his count is reported to us now as 3.6 million per cubic millimeter, in contrast to 4.5 million per cubic millimeter four and eight months ago.

Among the forty-four patients who were taking the diet well at the end of the first year there were five who in the course of the following year neglected the diet and took little liver for several months. Their counts then fell below 4, but not below 3.2 million per cubic millimeter. In one case an acute bronchitis apparently accelerated the decrease of the red blood cells. Two of the five patients have just resumed eating large amounts of liver. The counts of the other three increased rapidly to normal on proper resumption of the diet.

Five of the ten patients that took the diet poorly in the first six months were among the first we treated, and it is now recognized that they were not fed enough liver. When these five patients were later (two at the end of the year and three within one and one-half years) given a suitable amount of liver, their counts rose and have remained between 4.3 and 5.5 million per cubic millimeter for from one to two years with a single exception. In this case, liver was omitted for four months and the count fell to 2.5 million, rising promptly to above 4.5 million per cubic millimeter when liver was again taken in proper amounts. These cases illustrate well the importance of taking a sufficient amount of liver to accomplish the desired result.

From the foregoing data, it is apparent there were only two patients who had counts below 3 million per cubic millimeter when the liver treatment had once brought them to approximately 4 million or above per cubic millimeter, and these low counts appeared to be the result of a complete omission of liver for considerable periods. Moreover, in the entire 105 cases, with the exception of six which will be discussed separately, the counts have been rarely below 4 million per cubic millimeter two months after the diet was begun; and when this did occur, it could always be explained by either a complication or a partial or total omission of the liver diet.

### CASES IN WHICH THE RED BLOOD CELL COUNT REMAINED LOW

In the six exceptional cases, the red blood corpuscle count either has remained below 4 million per cubic millimeter or, on rare occasions, has reached or exceeded this level. Five of these patients began taking the diet about a year ago, and are recorded in the table as having taken it poorly during this time. The other began eating liver less than a year ago. There does not appear to be any valid reason for the low counts of three of these patients except that they took the diet improperly. In two of these three, after the diet had been taken for two months, the counts which were originally about 1.5 million per cubic millimeter did not go below 3.2 million per cubic millimeter. The third patient's count usually ranged in the vicinity of 3.5 million, but two months ago was 2.5 million per cubic millimeter. Since then he has eaten 200 Gm. of liver a day, and the corpuscles have increased to 3.8 million per cubic millimeter.

Of the other three patients who have continued to have low counts, one has taken liver daily in large amounts for eight months. The other two began doing so somewhat more than a year ago. These two patients have perhaps taken as much liver as some others whose counts have remained high, but they have not taken it in a manner considered satisfactory for them, and thus data for them are recorded in the table under the heading "diet taken poorly." One of these patients had marked arteriosclerosis, and is the one who fourteen months after beginning the diet died from cerebral thrombosis. When dietary treatment was begun he was desperately ill and, although he became obviously better in the last year of his life, the count remained low, from 2.5 to 3.1 million per cubic millimeter, with hemoglobin of 75 per cent. Although at first he took the diet well, he seemed unable to respond satisfactorily. The other of the two patients had a red blood corpuscle count of between 1 and 2 million per cubic millimeter throughout the year before he began to eat liver. His count increased unusually slowly and slightly for the first twelve weeks in spite of a satisfactory diet. In the following months he ate very little liver, and the count varied between 2.4 and 3.5 million per cubic millimeter. Then he took about 250 Gm. of raw liver pulp daily and the cells rose, though unusually slowly, to 3.9 million per cubic millimeter. This patient has pyelitis and perhaps some cirrhosis of the liver, which may be factors in accounting for inadequate blood formation.

The patient who has taken large amounts of liver for eight months and whose red blood cell count has remained relatively low, a man, aged 73, has had per-

nicious anemia for at least seven years. In the two years before commencing the diet he received thirty-five transfusions of blood, and during this time his red blood cell count was usually about 2.5 million per cubic millimeter with hemoglobin of 55 per cent. He took liver with difficulty at first, but since the first three weeks after beginning the diet he has eaten at least 225 Gm. of liver a day. Forty days after commencing the diet he felt symptomatically much better; although his red blood cell count had not risen, having remained about 2.5 million per cubic millimeter, the hemoglobin had increased from 50 to 70 per cent. At the end of four months the count reached 3.5 million per cubic millimeter, with a hemoglobin of 85 per cent. He has gained more than 30 pounds (13.6 Kg.), and in the last three months his red blood cells have remained just under 4 million per cubic millimeter. It is thought that in this case the multiple transfusions affected the marrow, so that it could not respond in an adequate manner. A similar state of affairs has been described to us for another patient. However, previous multiple transfusions do not always prevent the usual benefit from liver feeding, as other cases in which previous transfusions have been done many times have responded to liver promptly and rapidly.

Our experience with people who have responded slowly indicates the importance of perseverance and the probable desirability of sometimes forcing very large amounts of liver for months. Our observations also indicate that some patients when first placed on the diet respond sooner and faster than others, and although 100 Gm. of liver may produce rapid improvement, double this amount is more apt to do so.

### VARIATIONS IN THE RED BLOOD CELL COUNT WHEN REMAINING ABOVE FOUR MILLION

Fluctuations from time to time occurred in the numbers of red blood corpuscles when they remained above 4 million per cubic millimeter. It is at this level that they have been found repeatedly in about 85 per cent of all patients studied, between two months and three years after liver was first prescribed for them, in spite of some irregularities in diet.

In five cases counts of between 5.7 and 6.5 million per cubic millimeter have been recorded more than three times, some weeks apart. Patients with distinctly high counts have been advised to decrease the amounts of liver they were eating. This may account for subsequent slight diminutions. Of the patients taking the diet satisfactorily, 44 per cent had counts of 5 million or more per cubic millimeter within from four to six months, while about 32 per cent attained similar levels one, one and one-half, and two years after beginning the diet.

### THE SYMPTOMATIC IMPROVEMENT OF THE PATIENTS

(*a*) *In General.*—The general condition of these 105 patients with undoubted pernicious anemia has markedly improved in almost all instances soon after they commenced taking the diet, and the improvement has continued rapidly. As the number of red blood corpuscles increased, the symptoms of anemia diminished and vanished as the count approached normal. Thus, dyspnea, edema, palpitation, weakness, irritability, cramps in the muscles and the like decreased rapidly. An occasional patient felt abnormally weak even after his red blood cell count had been over 4 million per cubic millimeter for some time. Fever, when present, usually disappeared within less than ten days. Symptomatic improvement often appeared before there was a distinct rise in the numbers of red blood corpuscles or the concentration of hemoglobin. It is apt to be definite within ten days or when the reticulocytes have reached the peak of their rise.

Within ten days the lemon yellow color of the patients often decreased, and a pink flush of the cheeks and fingers appeared. The improved color, however, did not always signify an increased red blood cell count, which was quite possibly the result of changes in the blood volume and capillary circulation. When the count approached over 4 million per cubic millimeter, the patients usually developed ruddy countenances. It must, however, be remembered that pallor and anemia are not necessarily parallel attributes. Some patients with high counts and high hemoglobin percentages remain relatively pale, and in such cases inquiry has revealed that pallor was a constitutional characteristic of these individuals.

Thus, two months after commencing the diet the patients as a rule felt and appeared well, except for the occasional occurrence of symptoms and signs referable to the central nervous system. In many instances they then remarked that they felt better than for some years before the previously stated onset of their illness.

(*b*) *Gastro-Intestinal Symptoms and Signs.*—Usually within a week after beginning diet most of the patients had an increase of appetite with corresponding improvement in the general sense of well being. A ravenous appetite has been frequent, sometimes associated with temporary epigastric discomfort and a sense of general weakness. The keen desire for food after eating liver and the ability to take large amounts of it has occurred much less often among normal persons and patients with secondary anemia than among people with pernicious anemia. The former patients have occasionally been nauseated some hours after eating a large amount of liver. The appearance of these gastro-intestinal symptoms after taking large amounts of liver may, perhaps, be partially explained by a low level of the blood sugar which has been observed under such circumstances.[10]

The distressing tongue symptoms so characteristic of pernicious anemia usually vanished soon after liver was taken. Vesicles on the edges and tip of the tongue disappeared, as did the red-streaked, raw or beefy appearance. The sense of rawness or pain in the esophagus subsided. In a few patients who had a pronounced disorder of the central nervous system, the disappearance of the tongue symptoms and signs was less rapid. In none of the patients who have continued to take the diet well have the tongue symptoms either persisted or returned. Within a few months the tongue has usually lost its shiny appearance entirely and has appeared normal.

The gastric contents of eighteen patients were examined in the course of from two to twenty-two months after the diet had been instituted. Examinations for free hydrochloric acid at various times up to two hours after a test meal were negative in all cases. This does not exclude the possibility that occasionally free hydrochloric acid may appear, since this has occurred in a case reported by Shaw.[11] It is interesting to note that the conditions observed by us for pernicious anemia seem to apply to pellagra as well. According to Givens,[12] free hydrochloric acid remained absent in the stomachs of patients with pellagra in spite of the fact that they had been symptomatically cured by diet.

(*d*) *The Neural System.*—The symptoms in pernicious anemia which are referable to the neural system (spinal cord, peripheral nerves, and brain) yielded less completely and less readily to treatment than other accompanying conditions. Of our 105 patients there are thirty-one with prominent symptoms or signs of degeneration of the spinal cord, and there is at least one with a similar disorder of the brain. There are many more who have had mild symptoms referable to disturbances of the neural system. On the other hand, improvement in the neural symptoms has often been gratifying to the patient. Recently developed symptoms of injury to the nervous system have usually yielded more rapidly and satisfactorily than those due to long-standing lesions.

With few exceptions, patients have not developed neural symptoms, nor have they shown any extension or aggravation of such preexisting lesions after they have been on the diet for a month. The exceptions were limited to two patients in whom the spinal cord involvement was extreme, and to two others who neglected their liver diet for considerable periods. The increase of symptoms in three was slight, and the third developed only paresthesia of the hands, which disappeared when liver was adequately taken. Numbness and tingling in the extremities has disappeared or has been much reduced in nearly all instances, as have symptoms believed attributable to a neuritis. An impaired bone vibration sense has occasionally improved as determined by measurements with a tuning-fork. Of course, changes in reflexes have remained present. However, coordination of the extremities has distinctly improved in many cases, and has shown occasionally striking and continuous improvement even in patients with marked motor and sensory disorders. For example, two patients who had the greatest difficulty in moving about are now walking with comparative ease; another, formerly hardly capable of arising from a chair, is now able to do so easily. It would seem reasonable to attribute such improvement to an increase of muscular strength, and the development of the muscles secondary to the continuous high level of the number of the red blood cells. Appropriate exercise for retraining and muscle development is an important consideration in the treatment of these cases.

It is probable that the observations for every one of our patients who showed improvement in neural symptoms after taking the liver diet can be paralleled in similar cases of improvement in the course of some other form of therapy. It seems to us, however, that in the case of the liver treatment benefit has been more regular than in the course of other forms of therapy; and it is noteworthy that there has been no definite progression in neural lesions while large amounts of liver were taken. It is important to appreciate that the neural symptoms rarely improved until after the red blood cells had increased beyond 4 million per cubic millimeter.

### TREATMENT OF EARLY CASES AND PREVENTION

The liver diet has led to marked improvement in some patients with little or no anemia but with symptoms of a dyspeptic or intestinal nature, and whose general sense of well being has been much below normal. Some of these patients have achlorhydria and may be suffering from early pernicious anemia. Colitis has often been the diagnosis. In pernicious anemia, soreness of the tongue sometimes recurs intermittently even for years before the disease is suspected, and persons with this symptom alone may be improved by eating liver. One should appreciate that such and similar cases may be benefited by a liver diet, and that the time to begin to treat a patient with pernicious anemia is before anemia is obvious or when neural symptoms first appear. These observations suggest that intelligent diagnosis may fulfil a preventive function. Since in about 10 per cent of the cases pernicious anemia is a familial disease, investigation of the relatives of a patient for achlorhydria and other signs that occur in the disease may lead to the institution of a suitable diet and prevention. There are other types of patients who can be benefited by a diet rich in liver alone, or combined with the administration of iron, or other therapeutic procedures. This topic, however, is not pertinent to the present discussion.

### REASONS FOR THE CHOICE OF LIVER AND ITS POSSIBLE MODE OF EFFECT

Our belief that food might benefit the patient with pernicious anemia and perhaps do so in a specific manner was based, among others, on the following reasons:

1. A recognition of the similarity of certain symptoms and signs (especially referable to the gastro-intestinal, central nervous, and hematopoietic systems) of pernicious anemia to those of pellagra, sprue, and beriberi, diseases due to, or associated with, a faulty diet.

2. The observation that patients with pernicious anemia have often taken an abnormal diet for many years; noticeably one with a deficiency of red meats and an excess of fat, particularly derived from dairy products and pork.

3. The geographic distribution of the disease and the correlation of this with habits of diet and environment in different parts of the world.

4. The knowledge that secondary anemia was occasionally associated with a faulty diet, and the recognition of the importance of food to alleviate certain types of such anemia in man and animals.

5. The fact that patients with pernicious anemia often had better health when placed on a well balanced and high caloric diet containing an excess of nitrogen.

6. The nature of the disease, as presented below.

Pernicious anemia is often considered a disease primarily dependent on an increased destruction of red blood corpuscles, with secondary pathologic changes in the bone marrow. Pepper[14] in 1875 and Cohnheim[15] in 1876 were the first to suggest that the primary process for the cause of the anemia was in the bone marrow. Some years ago, Dr. James Homer Wright pointed out to us the similarity of the histology of the bone marrow to that of malignant tumors, and suggested that it was logical to regard the marrow as the seat of an essential lesion of the disease. Peabody's[16] studies on the pathology of the bone marrow clearly indicate the probability that the primary lesion for the anemia is in the marrow. Apparently the masses of megaloblasts found in the marrow in pernicious anemia during a relapse are unable to maturate properly, and it is a logical deduction to assume that they lack some factor on which this maturation depends.

Liver was chosen as a food in the hope that it might contain ingredients that would promote the growth of red blood cells, because it had been shown that liver feeding could profoundly affect the growth of animals,[17] and that substances within it could enhance cell division. It was likewise recognized that liver could benefit patients with sprue, pellagra and beriberi.

Another reason for its choice was the demonstration by Whipple and his associates[18] that liver exerted a striking effect on the regeneration of hemoglobin. In pernicious anemia, however, it has appeared to us that what the patients needed was something to permit the

growth of red blood cells, or, as Whipple [19] has suggested, to supply their stroma, rather than something that particularly caused regeneration of hemoglobin. In this disease the body contains much iron, and such red blood cells as are formed contain large amounts of hemoglobin. Even so, the diseased state is intimately bound up with dysfunction of pigment metabolism.

It is difficult to believe that the chief effect of liver is to stop a hemolytic process. Peabody [16] has suggested that it is very probable that liver may stimulate the maturation of the immature cells crowding the bone marrow. He has observed that during the time the red blood corpuscles of a patient with pernicious anemia increase to normal, the megaloblasts in the marrow decrease, and as the red blood cell count approaches normal, the histologic appearance of the marrow also approaches the normal. Our observations on the extraordinarily regular and prompt appearance of a temporary, often marked, increase of the young red blood cells in the peripheral blood following the feeding of liver also suggest a rapid maturation of the megaloblasts. In ordinary cases of secondary anemia there does not appear to be any significant increase of reticulocytes after the administration of liver, and in turn there is no accumulation of megaloblasts within the marrow.[20]

Thus, it may be that pernicious anemia is a disease that arises in a predisposed person because of a lack or unavailability in the body of something that permits the proper growth of blood cells. The lack of this, which may be a rather specific substance, is perhaps responsible for other lesions than those in the bone marrow; for example, degeneration of the spinal cord. This would be comparable to what occurs in pellagra. There is evidence that achlorhydria exists for a long time before the anemia of pernicious anemia becomes apparent, and thus achlorhydria may play a rôle in the production of the disease. It is not impossible that the lack of the necessary factor or factors may be secondary to digestive effects due to the achlorhydria. It seems as if one or more ingredients in liver supply the patient with a sufficient amount of something that he has not obtained from his diet, or that his body has lacked, for a long time.

### THE NATURE OF THE EFFECTIVE SUBSTANCE IN LIVER

We have demonstrated that the benefit of the diet advised heretofore is primarily due to large amounts of liver rather than to the other foods. Our original idea was that perhaps the effectiveness of liver was dependent in some manner on the completeness of the proteins, or a combination of the amino-acids, or the proteoses it contained. The benefit is not due merely to a high nitrogen content of the diet because, among other reasons, patients have recovered rapidly on diets containing only 60 Gm. of protein.

With Dr. Edwin J. Cohn and our associates [21] we have now shown that a nonprotein fraction of beef liver can produce a prompt and marked increase of the reticulocytes, cause a rapid rise of the red blood cells, and benefit patients with pernicious anemia in the same manner as whole liver. During the time these observations were made, West [22] also obtained a potent fraction of liver that has produced comparable results. Recently, Simmonds, Becker and McCollum [23] have stated that the effect we have obtained from feeding liver to patients with pernicious anemia is due to its vitamin E and iron content. They, however, have not tested any case.

The nonprotein fraction of liver that is effective in pernicious anemia and which acts in a rather specific manner represents less than 2 per cent of the organ. The indications are that known vitamins are not responsible for its beneficial effect. It is soluble in water, is alcohol precipitable, is insoluble in ether, is free of lecithin and ordinary lipoids, and contains about 7 per cent of nitrogen and only a small trace of iron and sulphur. Vitamin E is insoluble in water and is soluble in ether. Thus it does not seem to us that vitamin E and iron are the factors in liver primarily responsible for causing improvement in patients with pernicious anemia. Furthermore, a case treated for ten days with a total of 150 cc. of wheat germ oil from about 1,500 Gm. of wheat embryo, which is very rich in vitamin E, did not show a rise of reticulocytes or signs of improvement. This patient at a later date ate liver and became better rapidly.

Our observations show that a few grams of the purest fraction or 15 Gm. of a less pure fraction of liver taken daily by mouth as a powder or in aqueous solution have yielded results comparable to those obtained when 200 or more grams of whole liver have been eaten. Thus, in the future one may be able to prescribe a small amount of a powder rather than a large amount of liver. Even so, the patient must take a well balanced, adequate diet, preferably similar to that our patients have had except for the amount of liver.

### DIET TAKEN BY THE PATIENTS

The diet described a year ago [7] has with some minor variations been taken by the 105 patients, and those who have done best have taken it continuously. This diet includes, besides large amounts of liver (200± Gm. cooked weight a day), generous amounts of fruits and vegetables, containing especially from 5 to 10 per cent of carbohydrate, and red muscle meat. It was advised that the diet contain less than 70 Gm. of fat, little sugar, and that concentrated carbohydrate food and milk never be included to the exclusion of desired foods.

Cooked liver may be served in any way that pleases the patient, but prolonged boiling is to be avoided. The broth in large amounts is effective. Mammalian liver is possibly more effective for these patients than that of fowl. Kidneys can also promptly increase the reticulocytes and numbers of red blood cells in pernicious anemia, and thus may be substituted for liver. Raw liver is perhaps more efficacious than cooked. It may be given as finely divided liver pulp. Many patients have preferred raw liver pulp to cooked liver as they look on it more in the nature of medication than food. This is because it is simple to take and can be rapidly swallowed. We have prescribed often about 180 Gm. of the prepared pulp (about equal to a similar amount of cooked liver) a day, divided into two portions and taken mixed with orange juice or water, midmorning and mid-afternoon. This requires the patient to drink only about 500 cc. of the mixture a day. The juice pressed from raw liver is efficacious in large amounts. The possibility of infection with parasites seems remote.

If necessary, liver may be administered by a stomach tube. Very sick patients so treated have shown a remarkable and rapid improvement. At first the patient is often able to take only a little liver, but by perseverance, encouragement and attention to all aspects of a given case, and giving but little other food, we have soon been able to induce these individuals to take the full amount.

The problem of how much liver the patient should continue to eat after his red blood cell count is normal remains unsolved. Under these circumstances, some

have taken only 150 Gm. three times a week. It appears, however, that some patients require more than others to keep them in the best condition. Perhaps an excess of liver or fraction of it can undesirably force the delivery of cells from the marrow, and hemoglobin formation may fail to keep pace with cell production.

The first patients treated often took 120 or more grams of red muscle meat a day. Many have taken much less. However, it seems wise that the patients include in their diet at least a liberal amount: 70 Gm. a day. It is advised that fruits and green vegetables be prescribed in generous amounts, and, if gastro-intestinal symptoms demand it, strained or in the form of a purée. We have demonstrated that excess of fat will not inhibit a rapid growth of red blood cells in pernicious anemia. In large amounts it may upset the digestion, cause undesirable gain of weight, and for theoretical reasons it may be harmful for patients with pernicious anemia. Thus fat, perhaps, should be taken moderately, except by thin individuals.

Sweet and soggy starch foods often intensify colonic indigestion, a condition frequently present, and as they have no particularly favorable effect on blood formation, they should be curtailed. The diet for each patient should be prescribed for that given person and must contain large amounts of liver or its equivalent and foods to supply liberally, but not excessively, all the requirements of the body. Successful treatment demands caring for the patient—not prescribing for his case. It will often necessitate much time, tact and sympathy to get the patient to take the correct food. It is also important to emphasize the necessity of prolonged continuation of the diet. Thus attention to detail, faith and cooperation are helpful for satisfactory results.

Treatment other than dietary and the administration of a preparation of liver is subsidiary.

## COMMENT

It is obvious that failure of treatment may be dependent on an incorrect diagnosis. The diagnosis is not difficult to establish if pains are taken to study the patient carefully. Aleukemic myelosis, aleukocythemic stages of leukemia [24] and sprue are perhaps the most difficult conditions to distinguish from pernicious anemia.

A diet rich in liver can benefit other patients than those with pernicious anemia. In view of the fact that most cases of this disease have responded promptly to the liver diet and only a few slowly, one should recognize that if a patient supposed to have pernicious anemia is placed on this regimen and has shown little or no improvement at the end of about six weeks, it is highly probable either that liver in one or another form has not been taken in adequate amounts, or else that the patient does not have pernicious anemia. There may be a rare case of this disease that cannot respond to liver feeding alone. Although liver has often caused very ill patients to become rapidly better, such patients may be treated too late and die before an adequate amount of liver or a preparation of it can be administered. Successful therapy of pernicious anemia depends on the treatment being properly carried out for a correctly diagnosed case. With these conditions established, we believe that essentially all patients with pernicious anemia can be benefited, and usually markedly and promptly.

## SUMMARY

The study of 105 cases of pernicious anemia treated for from three months to three years with a diet rich in mammalian liver (200 ± Gm. cooked weight daily) shows that this diet can benefit essentially all patients with this disease. The improvement is usually rapid and striking, and there is a marked and prompt increase of the red blood corpuscles in almost every case.

Ninety patients were placed on the diet at a time when their red blood corpuscles were below 2.7 million and averaged 1.48 million per cubic millimeter, and the other fifteen commenced the diet when their counts were above 2.8 million per cubic millimeter.

The red blood cells of ninety-nine patients reached 4 million or more per cubic millimeter, and if the diet was adequate this level was reached within about two months. The counts have remained at or above 4 million per cubic millimeter except for temporary, seldom marked drops in approximately 15 per cent, particularly associated with the partial or complete omission of the prescribed amount of liver. Counts of 5.7 million or more per cubic millimeter occurred in several cases.

The health of the remaining six patients has been distinctly improved, although their red blood cells have not reached 4 million per cubic millimeter. In three this was owing to an insufficient amount of liver in the diet. The other three patients took the diet at first satisfactorily, but their red blood corpuscles increased unusually slowly. After taking the diet well for a few months the counts of two have remained about 3.8 million per cubic millimeter. Later the third patient took the diet inadequately, until he died of cerebral thrombosis. Two other patients are dead, but death was apparently not due to anemia, because not long beforehand their red blood cell count was high. One was killed in an accident, and the other died from unknown cause. Perhaps in spite of perseverance with the diet a case may rarely show little or no improvement.

The ultimate effect of feeding with regularity large amounts of liver, or something contained in it, together with an otherwise adequate diet, can be determined only in the future.

Eighty-one of the ninety patients whose red blood cells were originally below 2.7 million per cubic millimeter have taken the diet in one way or another for at least about five months. Then their counts averaged 4.59 million per cubic millimeter. Fifty-two patients have continued to take the diet for a year or more. Forty-four took it satisfactorily during the first year, and at the end of that time their counts averaged 4.68 million, when the counts of the remaining eight, who took the diet unsatisfactorily, averaged only 3.36 million per cubic millimeter. Twelve have had the liver diet for two years or more; two of these have taken it for three years. At two years and three years the average counts were about 4.50 million per cubic millimeter, and now the count of every one of the twelve is above this level.

Failure to take a sufficient amount of liver, or the presence of a complication, such as an infectious process, may cause the count to fall or may cause it to rise less rapidly than might be expected. Injury to the bone marrow from multiple transfusions of blood may be a reason for an unsatisfactory response to liver feeding.

Symptomatic improvement has been marked. Appetite has improved rapidly and gastro-intestinal symptoms have decreased quickly. The tongue has often become normal in appearance, but achlorhydria has persisted in the eighteen patients examined. Improvement in neural symptoms has been most gratifying to the patient, and such symptoms have not definitely progressed or developed under adequate dietary treatment.

Patients with pernicious anemia having little or no anemia can be benefited by the diet.

It is thought that liver, as well as kidney, feeding stimulates maturation of the megaloblasts that crowd the bone marrow of pernicious anemia in relapse.

A few grams a day of a nonprotein fraction of liver acts in a rather specific manner. It produces a prompt, marked, temporary increase of reticulocytes, causes a rapid rise of the red blood corpuscles, and appears to benefit patients in the same manner as whole liver.

In the future, one may be able to prescribe a small amount of a fraction, rather than large amounts, of liver. Even so, the patient must take a well balanced adequate diet. Treatment other than dietary and the administration of a preparation of liver is subsidiary.

## ABSTRACT OF DISCUSSION

### ON PAPERS OF DR. MACHT AND DRS. MINOT AND MURPHY

DR. H. M. CONNER, Rochester, Minn.: Dr. Macht's work is interesting, and may prove to be one of our valuable methods in the diagnosis of pernicious anemia and in the control of treatment. Possibly the toxin has its origin in the intestine, resulting from the achlorhydria and, perhaps, also from vitamin deficiency. I have reported results on eighteen patients treated with gentian violet and a mixture of acriflavine and gentian violet on the basis of intestinal infection as a cause. More than fifty patients have now had the treatment. The eighteen patients showed an average increase in red blood cells and hemoglobin of almost 100 per cent and in leukocytes of almost 50 per cent. The report of Minot today shows the most brilliant results in the treatment of pernicious anemia. The liver diet left much to be desired, but this extract may prove our most valuable treatment. In February, 1926, on the basis of vitamin deficiency, I treated nine patients with cod liver oil, getting no result. In April, 1926, a high vitamin diet was begun but the work was interrupted a few weeks later by relinquishment of the hospital service until January, 1927. Thirty-seven patients have been thus treated. Vitamin deficiency suggested itself by the resemblance of pernicious anemia to sprue and pellagra. There is some objection to the yeast and the cod liver oil; yeast extracts may be used instead, and possibly cod liver oil tablets may be substitued. The reticulated cell count has increased to many times its original level, in two cases to 21.6 per cent and 22.4 per cent, respectively. The red cells rapidly increased, appetite increased, and the general condition markedly improved. Certainly, the results are encouraging. The high vitamin diet has an advantage over liver because of its palatability and the lessened possibility of disturbing the general metabolism. The diet consists largely of eggs, green vegetables, milk, cream, butter, raw fruits (particularly oranges, lemons, grapefruit and tomatoes), cod liver oil, and brewers' yeast. Sixty grams of meat and 60 Gm. of liver are given daily. The recent work of McCollum suggesting vitamin E as being concerned in iron metabolism puts additional stress on the use of the high vitamin diet in the treatment of pernicious anemia. I believe that treatment in the future may resolve itself into the use of intestinal antiseptics, such as the dyes mentioned, in combination with the liver diet, the liver extract or the high vitamin diet.

DR. WALTER L. BIERRING, Des Moines, Iowa: In evaluating any treatment, particularly for a condition like pernicious anemia, it is necessary that it should be carried on through a long period of time. Any details which will increase the palatability of the diet will secure the better cooperation of the patient and necessarily also better results. The liver diet for each day should best be prepared by some other member of the household besides the patient, or, better still, by a nurse. The usual daily portion of 8 ounces or 250 Gm. is passed three times through a meat grinder, and the resulting pulp is placed on ice. One half of this amount is served at a time, being placed in a glass tumbler covered to one half its extent with fresh orange juice, after which it is thoroughly mixed until each particle of liver is covered or surrounded with orange juice. The mixing process is important, and greatly determines the palatability of the mixture. The glass is then filled with orange juice, and then after some further stirring is poured into a clean glass and served on a tray. If prepared in this way there should be no taste or odor of liver. I know a physician who sips it with a spoon. Another important factor is to serve it between meals, one dose in the forenoon and the other in the afternoon. At other times or at mealtime, the patient need not be concerned with the taking of liver. Taken in this way it may be regarded as a tonic. The colleague referred to says that after taking this tonic in the morning, he can work in the operating room for two hours without feeling any fatigue. During the last twenty-five years, we have all experienced some remarkable remissions in pernicious anemia; yet it is evident to all who have carefully studied the results of a diet rich in liver that the remissions are distinctly different from those formerly observed. The rapidity of improvement in the blood picture, and the stability and constancy with which it is maintained, are truly remarkable. The important point in this plan, as emphasized by Dr. Minot, is that the liver diet must be faithfully kept up; in fact, the patient must live on liver in some form, because lapses are rapidly indicated by a lowering of the blood curve and the return of other symptoms of pernicious anemia.

DR. J. H. MEANS, Boston: When Dr. Minot first told us of his discovery of the use of liver in pernicious anemia more than a year ago, patients at the Massachusetts General Hospital were given the treatment, under special observation by a member of the staff, Dr. Wyman Richardson, who made it his job to study them carefully and collect the data, both clinical and laboratory. We have had thirty-two cases, and every one of them showed precisely the reaction that Dr. Minot has demonstrated. One person died of pneumonia as the diet was being started, and at a time when he apparently had begun to react. The red cell counts rise from an average of 1½ million to 4.8 million. The reticulated cell rise, as Dr. Minot has said, in our cases began on the fourth day of the diet and reached the peak about the seventh day. The red cell count began to go up about the time that the peak of the reticulated count was reached. The rise in the red cells was in general at the rate of somewhere near a million a week. One of the most important points we should bear in mind is the specific nature of this reaction. It is not simply that liver is good in anemia, but that Dr. Minot has found a highly specific agent in liver and certain other tissues which brings about a characteristic reaction in pernicious anemia which is just as striking as is the effect of orange juice in scurvy or cod liver oil in rickets, or thyroid in myxedema. The work of Peabody is of the utmost importance as being in line with Dr. Minot's own. In other words, the marrow is hyperplastic, but ineffectual. It is trying to hyperfunction but is unable to do so. It is analogous to what Marine found in cretinous puppies—hyperplastic thyroid but the clinical signs of myxedema. In the cretinous puppy and in the patient with pernicious anemia, the supply of a necessary substance abolishes the hyperplasia and permits normal function, in the one case of the thyroid, in the other of the bone marrow. I admit that this analogy may prove of a crude sort only.

DR. E. A. BAUMGARTNER, Clifton Springs, N. Y.: We have tested fifteen patients with tropical sprue and seventeen cases of pernicious anemia. Of the fifteen patients with sprue, only two gave a low Macht index. Of the patients with pernicious anemia who were tested, eight conformed exactly in the phytotoxic index and diagnosis of pernicious anemia made by Dr. Macht. In one, the diagnosis of pernicious anemia was doubtful as there were no neurologic symptoms, and the Macht index was 60 per cent. Two patients have been treated with eosin intravenously and with general irradiations of ultraviolet rays. Unfortunately, one of these did not have a phytotoxic test made until a few weeks after treatment began, when the index was 64 per cent. On further treatment, the index, a month later, read about 71 per cent. The red blood count on admission was 2.8 million, and the hemoglobin 66 per cent.

After one month of treatment, the red count was 4.4, and the hemoglobin 70 per cent. The other patient had an index prior to treatment of 51 per cent; a red count of one-sixth million, and a hemoglobin of 38 per cent. Three weeks after receiving the ultraviolet irradiations and eosin, the phytotoxic index was 62 per cent and the patient showed improvement in the blood count and hemoglobin. Another patient on the liver diet, plus eosin by mouth and ultraviolet irradiations, showed a decrease in the toxicity of the serum from 48 per cent to 57 per cent in six weeks. The patient who entered with the diagnosis of sprue, and whose diagnosis was changed to pernicious anemia, had originally a phytotoxic index of 44 per cent, a red count of 3 millions and a hemoglobin of 60 per cent. About a year later, after eating some liver at home, the index was 54 per cent, showing some detoxification. Two months later, after being on liver diet and at the same time receiving eosin by mouth and ultraviolet irradiations, the index was 71 per cent; the hemoglobin, 82 per cent, and the red count, 4,360,000.

In the sprue patients with a low phytotoxic index, treatment with eosin and ultraviolet irradiations also resulted in distinct improvement, both in the blood count, the hemoglobin and the phytotoxic index. Most of the untreated cases of pernicious anemia showed a low phytotoxic index, that is, exhibited marked toxicity. In the great majority of the sprue cases the serums did not show the characteristic toxicity of the pernicious anemia serums, with the exception of two cases. As to the result of treatment, it was found that in pernicious anemia patients, the phytotoxic index improves parallel to the improvement in the blood picture, either on treatment with liver diet alone, or with ultraviolet irradiations and eosin alone, or on a combination of liver diet with the ultraviolet ray and eosin. The sprue patients also show similar improvement with a high protein diet (not liver) plus ultraviolet irradiations and eosin.

DR. JOHN A. LICHTY, Clifton Springs, N. Y.: About a year ago at the Clifton Springs Clinic we selected the histories of all our patients having pernicious anemia, about 500, and tried to decide what we had accomplished. This was just about the time that the liver treatment began. One hundred and fifty of these were my own cases, selected from private and hospital practice during the twenty-five years before I joined the Clifton Springs Clinic. There were twenty-six patients of whom I had lost sight, and all the others were dead but three. One of the three living is now going into the twenty-second year of the disease that we know. He may have had pernicious anemia. In any treatment suggested, therefore, we always have in mind the possibility of a patient living at least twenty-two years without any specific treatment other than that which has occurred from time to time during those years. We are, therefore, very much interested. We have instituted the liver treatment in twelve cases since the first of January, and have had results very much as were shown on the screen by Dr. Minot. We have treated three cases according to Dr. Macht's suggestion, that is, given eosin intravenously and quartz light irradiations, exposing the entire body. In these three cases we do not see any difference in our results from those that we have treated with the liver diet.

The one important point in which Dr. Macht has helped us is in the differential diagnosis between sprue and pernicious anemia. There are certain times in the cases of pernicious anemia when a patient is going into a remission or coming out of it when the blood picture is entirely different, and there are also certain times in the cases of sprue when the blood picture approaches that of pernicious anemia. It is therefore difficult to tell from the blood picture with what disease one is dealing. At those times we find that the Macht test has helped us immensely. We have had some fourteen cases of sprue in the last twelve months, and in the past winter we have used this test with apparently great help. I feel, of course, that we are going along rapidly in our understanding of pernicious anemia, but comparing this disease with typhoid and malaria from an etiologic standpoint, we are far from being able to say that we have a cure. Until we have the etiology there cannot be that prevention of pernicious anemia that is established in typhoid, malaria and such other conditions which are better understood. We are hoping that in this reawakening of interest in pernicious anemia something will be found to elucidate the etiology of this disease to the extent that it will be possible to prevent it. Our studies of achylia gastrica in relation to pernicious anemia are bringing out some very interesting problems.

DR. KARL K. KOESSLER, Chicago: Drs. Murphy and Minot published the first report on the use of liver in the treatment of pernicious anemia in THE JOURNAL, Aug. 14, 1926. In the same number, immediately following their article, you will find a paper by my collaborators and myself on experimental work done in the University of Chicago on vitamin deficiency in relation to primary and secondary anemia. Until a few weeks ago I assumed that the results of Drs. Minot and Murphy with feeding liver, based on the experimental work of Whipple and Robscheit, were due chiefly to the fact that the liver is the chief storage organ of the fat soluble vitamins A, D and E, especially A, as shown by Steenbock of Madison; but recently they believe that they have shown that a fraction which they have isolated from the liver, active in blood regeneration, does not contain any fat soluble vitamins. If this assumption is correct, we must reach the conclusion that there exists a substance in liver connected with blood regeneration which is not a fat soluble vitamin. This observation, however, does not by any means do away with the proved effect of vitamins in the treatment of pernicious anemia which we have been able to show in thirty-five cases treated. We also are able to produce by certain methods a blood picture in the experimental animal which is in every detail identical with that of pernicious anemia in man. In these rats the blood picture can be brought back to normal with liver just by feeding them vitamins A, B, D and E. We therefore have to deal, in all probability, with two known factors involved in blood regeneration: one, the fat soluble vitamins, and second, a substance contained in liver, probably an amine. It may be said that our results cannot be brought about by vitamin A alone, but it is not rational to use a diet in the treatment of pernicious anemia which is particularly rich in one vitamin but entirely unbalanced otherwise. In our article we recommended the feeding of liver, sweetbreads, kidney and brains since they are extremely rich in fat soluble vitamins. Today we have to acknowledge that there is a factor, discovered by Cohen and Minot, which has a peculiar effect on blood regeneration, but it must be emphasized that this blood regeneration will not be accomplished in the treatment of patients with pernicious anemia in the absence of fat soluble vitamins.

DR. DAVID I. MACHT, Baltimore: Dr. Lichty approached the subject which we intended to keep for another communication. The Clifton Sanatorium staff have been very kind to send me a series of sprue specimens. I think about fifteen have so far been studied by me and the diagnosis in these, as compared with pernicious anemia, was quite distinct. The index in pernicious anemia is about 50 and less. In the case of sprue, in thirteen of these fifteen cases, it was much higher. The sprue specimens were not as toxic. They could thus be classified separately from pernicious anemia. Another astounding thing is in connection with leukemias. I have examined several such specimens. While this is a grave condition, leukemic blood is absolutely the same as normal blood in respect to its effect on plant protoplasm. The one disease that comes nearest in toxicity to pernicious anemia is that other baffling one of which we do not know anything —Hodgkin's disease. That gives a toxic index which is quite high, but not the same as in pernicious anemia. I might add that I just published a small note in the *Proceedings of Experimental Biology* on three cases of hemophilic blood which I examined and became interested in through the work of Howell. Howell asserts that hemophilia is due to an abnormality in the blood platelets. These three cases were negative, confirming his theory. THE JOURNAL recently published an editorial quoting the work of McCollum as throwing light on the mechanism of the action of liver diet in pernicious anemia. Judging from this work, there would seem to be some relation between vitamins and assimilation of iron. May I suggest another hypothesis? This is one which I have not put to experimental test, and which

Dr. Minot may disprove if he has sufficient data on the various fractions of liver which he has been studying. I have studied the effect of various dyes and chemicals as light sensitizers in respect to the detoxification of pernicious anemia serum. Among these were various derivatives of fluorescein, and also a blood pigment, hematoporphyrin. This last has been shown by others to be a very powerful photosensitizer, not only for the ultraviolet rays but also for the longer visible light waves. I found that hematoporphyrin acted also as a sensitizer for light in decreasing the toxicity of pernicious anemia serum. It occurred to me that the liver is rich in the decomposition products of blood and its various pigments, among them hematoporphyrin. I wonder whether (but I have no proof) the pigments found in liver substance play some rôle in connection with its very marked and beneficial therapeutic action in pernicious anemia.

DR. GEORGE R. MINOT, Boston: May not the toxic products in the blood be the result of the disease rather than its cause? This state of affairs would be comparable to the reasonable belief that the disorder of pigment metabolism is secondary to abnormality of blood formation. It seems very unlikely that feeding liver or an effective fraction stops a hemolytic process. There is evidence that the effective substance rapidly and with regularity promotes the growth of the formed elements derived from the bone marrow, and it appears to do so in a rather specific manner. Dr. Macht's studies are interesting in view of the known influence of light on certain specific substances. In answer to Dr. Conner: Drs. Murphy, Monroe and Fitz have studied the nitrogen and other chemical constituents of the blood. They have found that the ingestion of large amounts of liver has not caused accumulation of such products in the blood, even when the kidneys have been somewhat impaired. There is no doubt that vitamin deficiency can lead to inadequate blood formation and anemia. One cannot logically deduce that because vitamin A alleviates the anemia produced in animals by lack of this vitamin it is important as a factor to enhance blood regeneration in the disease pernicious anemia. Two of our patients given the extract, which does not contain vitamin A, showed a prompt marked response to it while taking almost no food and essentially none containing vitamin A. In studying the effectiveness of substances on blood formation, one must distinguish the different varieties of altered blood formation and their causes. At present the fraction of liver has not been given to any patient with secondary anemia. The problem of the relation of vitamins to blood formation is important, and one that we shall probably know more about in the future.

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**Good Posture Dependent on Desire.**—Much time is given in most schools to posture training. We may give posture drills daily to the end of time, but if the ideal of posture and the desire for it are not present we shall obtain small results. The seniors in our training school of physical education put over a posture drive this spring with the double purpose of learning how to do such things for their future positions and for the effect on the university girls. In order that—as they expressed it—the girls might "get some kick out of it," it was put over with all the pomp and splendor of a political campaign. Advance press work in the college paper was used and also posters with punch, such as "The Daily Doings of the Hump Family" (with apologies to the Gump family). They placed tags on the trees and statues that carried themselves poorly. There were rhymes, skits, songs, stunts and movies. As posture is not a matter of physical education alone, the psychology department took up the psychology of good posture, the educational department discussed posture as a vocational asset, the art department dwelt on the beauty of posture, etc. On the final night the girls went to the different houses and gave the posture test to all, presenting a perfect posture tag to those passing. The house holding the larger percentage of tags received a bronze plaque made for us by the sculpture department. More attempts of this sort to enlist popular interest would do much to put our work over into the lives of the girls.—Alden: A New Program in Physical Education, *J. Educational Method*, March, 1924, 272-273.

# TREATMENT OF PERNICIOUS ANEMIA WITH A HIGH CALORIC DIET, RICH IN VITAMINS

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In an article a year ago on the relation of anemia, primary and secondary, to vitamin A deficiency, we [1] reported on the experimental production of a blood picture in animals, which in all essential details showed a striking similarity to human pernicious anemia. On the basis of this work we reached the conclusions that:

1. The fat soluble vitamin A is essential for normal blood regeneration.
2. The addition of vitamin A to the diet of animals long depleted in their vitamin A reserve brings about rapid formation of new blood cells.
3. A definite relationship exists between a state of chronic vitamin deficiency and certain anemias in man, and
4. The routine use of a rationally balanced diet rich in vitamins A, B and C had proved itself of decided value in the blood regeneration of patients suffering from pernicious anemias and is the most promising procedure in the treatment of this disease.

The theoretical considerations, clinical observations and experimental evidence that led to the concept of the vitamin theory of the pathogenesis of pernicious anemia are stated in the article quoted.

Here only the assumptions made by this theory may be related in brief:

1. The changes in the bone marrow, blood and intestinal tract are probably due to a chronic deficiency or imbalance in fat soluble vitamins.
2. The lesions and symptoms of the nervous system so similar to the ones found in pellagra may be related to a chronic deficiency in vitamin B, and
3. The tendency to hemorrhages, retinal and otherwise, may be due to a long standing deficiency in vitamin C.

It may be recalled that such a deficiency in the vitamin content of the tissues might be produced in a variety of ways: first, through chronic underfeeding with these essential foodstuffs over a period of many years, and, second, through long-standing infections which are able to deplete the body of its vitamin reserve stock or which interfere with its proper utilization or with the storage power of the organism. A vicious circle may be established through the fact that vitamin exhaustion opens the way to infection and intoxication through increased permeability of all the protective mucous membranes of the body.

## THE DIETARY HISTORY OF PATIENTS SUFFERING FROM PERNICIOUS ANEMIA

Careful inquiry into the dietary habits of patients suffering from severe anemia leads to the information that between 75 and 80 per cent of all patients suffering from the disease have lived on a regimen deficient in essential foodstuffs for many years. It is natural that such faulty dietary habits are more common in poor people, but they are by no means restricted to this class. The average man prefers meat, potatoes, gravy and pie to any other foods and often considers this the only virile form of a menu. His luncheon and dinner con-

* From the Otho S. A. Sprague Memorial Institute and the Department of Pathology, the University of Chicago.

1. Koessler, K. K.; Maurer, Siegfried; and Loughlin, Rosemary: The Relation of Anemia, Primary and Secondary, to Vitamin A Deficiency, J. A. M. A. 87:476 (Aug. 14) 1926.

sist mainly of these articles of food. Such a diet is very deficient in vitamins A, B, C, D and E, and if adhered to over a period of many years might well lead to an exhaustion of the vitamin reserve.[2] Nor are women any less guilty in avoiding similar mistakes in the composition of their diet. Tea and coffee, hot bread and biscuits and an overindulgence in sweets supplant too often a rational choice of foods.

It is not the complete absence of these essential food factors from the daily diet that brings about ill health, but the chronic underfeeding with them over a long period of years. Pernicious anemia occurs most commonly in the age between 50 and 60, often the result of faulty eating over a period of from ten to fifteen years. In periods of stress and of enforced economy in food materials, impoverishment of the organism of its vitamin reserve might be brought about in a much shorter time. There can be little doubt that the frequency of pernicious anemia increased markedly in Germany in the decade 1915 to 1925,[3] and it is natural to connect this fact with the enforced economy in the varieties of healthful foods which the war necessitated. In these years following the war pernicious anemia seems also to occur in central Europe more frequently in younger people (ages 30 to 40 years) than in the years preceding 1914. We are also under the impression that more people with pernicious anemia come to a general hospital in the early spring months, March, April and May, than during any corresponding period of the year. We believe that a relapse occurs most commonly after the winter months, during which fresh vegetables and fruits have been more or less completely absent from the table and the milk and butter are frequently poor in vitamin A.

## DIETARY MANAGEMENT

A diet rich in all vitamins is insisted on. Vitamin A is first supplied to the anemia patient by giving cod liver oil, 5 cc., four times daily. Butter (not oleomargarine), from five to six pats, should be taken daily on vegetables and on bread. Whole wheat bread made with milk instead of water is richer in vitamins A and B than white bread. Wheat germ in an alcoholic concentrate is used as an excellent source of vitamins A, B, D and E, and when it is given in orange juice all five known vitamins are supplied at once.

Whole milk and cream are valuable foods since they contain, especially in summer, a good deal of the three vitamins A, B and C.

Eggs, especially the yolk, are rich in vitamin A and also contain B.

Vegetables that should be taken daily are tomatoes, fresh if possible, and stewed or canned if not in season. They are a very rich source of vitamins B and C and contain also A in smaller amounts. Then spinach (A, B), lettuce (A, B, C), cabbage (fresh, raw, A, B, C) and carrots (A, B, C). In addition or as substitutes may be eaten fresh string beans (A, B, C), Swiss chard (A, B), dandelion greens (A, B), or beetgreens (A, B), cauliflower (A, B, C), endive (A, C), peas (A, B), sweet potatoes (A, B), and Hubbard squash (A). Fruits should be taken daily to furnish plenty of vitamin C and to a lesser degree A and B. The best fruits for this purpose are oranges, lemons, grapefruit, pineapples (if possible, fresh), strawberries, raspberries (C), apples (sauce) and bananas. All these are to be eaten fresh if possible.

Of meats, liver and kidney contain the largest amount of vitamins A and B and also some C. Sweetbreads and brains, beefheart and lungs stand next in richness in vitamins. Beefsteak or any other part of the skeletal muscle is much inferior in vitamin content.[4]

The menu given herewith may serve as an example of the diet to be consumed in twenty-four hours.

### MENU FOR TWENTY-FOUR HOURS

*Breakfast:*

One orange sliced, or one half grapefruit, or one baked apple with cream, or a dish of applesauce or fresh pineapple or prunes.
Graham bread made with milk, two or three slices equal to 40 Gm., toasted.
Orange marmalade or raspberry jam if desired.
Butter, two prints, 10 Gm. each.
Oatmeal, one dish equal to 20 Gm. of dry weight (3 heaping tablespoonfuls).
Cream, 20 per cent, as much as desired.
Eggs, one or two (at least the yolks).
Milk, two glasses, each 6 ounces of milk and ½ ounce of cream. If this quantity of milk is too much if taken at breakfast, one glass can be taken two to two and a half hours later.

*Dinner at noon:*

Milk and cream, 6 ounces of milk and ½ ounce of cream.
Whole wheat bread made with milk, 40 Gm.
Butter, two prints, 10 Gm. each.
Meat: liver (calf's liver, chicken liver, goose liver, liver sausage), or sweetbreads, or kidney (veal or mutton), or calf's brains, or calf's lungs, 150 Gm.
Tomatoes, fresh, stewed, boiled or canned, 100 Gm.
Spinach or carrots, 100 Gm.
Lettuce or raw cabbage (cole-slaw), with oil and lemon juice.
Custard or omelet with jelly (raspberry or orange marmalade), or vanilla ice cream.

*At 4 o'clock:*

One glass of milk, 6 ounces of milk and ½ ounce of cream.

*Supper:*

Any one of the meats given under Dinner: 100 Gm. of liver, kidneys, sweetbreads, brains, beef-heart, lungs, or 100 Gm. of beefsteak or lamb, or instead of the meat, two eggs.
From one to two glasses of milk, 6 ounces of milk and ½ ounce of cream.
Bread, whole wheat, from 30 to 40 Gm.
Butter, two prints, 10 Gm. each.
Tomatoes, spinach, Hubbard squash, carrots, cauliflower, peas, beans (kidney, navy or fresh string beans), sweet or Irish potatoes, beet-tops, Swiss chard, lentils, lettuce. At least three vegetables, from 80 to 100 Gm. of each.
If two glasses of milk cannot be taken with supper, one of them might be drunk before retiring.

*Medication:*

One-half hour before each meal, 1 tablespoonful of wheat embryo extract in orange juice.
Immediately before each meal (three times daily) 50 drops of dilute hydrochloric acid in orange juice or water.
During the meal, 50 drops of dilute hydrochloric acid in water.
After the meal, 50 drops of dilute hydrochloric acid in water.
Three times daily, from one to two teaspoonfuls of powdered brewers' yeast (Harris') or three times daily two tablets of Harris' Yeast Tablets (standardized for vitamin B content).
The full diet contains all the iron required. As long as the full diet cannot be taken three times daily, one teaspoonful of a 10 per cent aqueous solution of ferric citrate should be taken in the milk drunk with each meal.

It is seen at a glance that this diet does not impose any hardships on the patient. Most of the foods it contains are eaten daily by many people and in addition it includes certain meats in the form of the edible viscera which are usually not partaken of at all or only very occasionally. In this connection it may not be misplaced to point out how important it is that such meats as liver and kidneys are prepared in an easily digestible, appetizing manner. To tell a patient with a complete achylia to eat so many ounces of liver a day and let it go at that would frequently invite failure. The most common way of preparing liver is to fry it; if, then, the cook does not know that liver must never be salted while cooking but only just before serving, since liver when salted on heating becomes hard, the liver reaches

2. Compare McCollum and Simmonds' Food, Nutrition and Health, page 17.
3. The Increase of Pernicious Anemia, Berlin Letter, J. A. M. A. **88**: 1020 (March 26) 1927.
4. A valuable list giving the vitamin content of the most common foods has been prepared by Sybil L. Smith, specialist in biochemistry, Office of Experiment Stations, U. S. Department of Agriculture, and may be obtained by writing to the Bureau of Home Economics, U. S. Department of Agriculture, Washington, D. C.

the patient in such a state of consistency that it can hardly be chewed and still less digested. Liver and kidney should be parboiled for about twenty to thirty minutes, and then broiled (not fried!) on both sides, so that the inside of the slice is still somewhat rare.

As long as the patient is conscious and able and willing to take nourishment, it is usually not difficult to make the patient eat the diet from the first day of treatment; of course not the complete diet of from 2,500 to 3,000 calories, but the essentials can be partaken of from the first day on and the majority of the patients take the full diet inside of a few days, after treatment is started.

Patient understanding and kind reasoning on the part of the physician will accomplish a great deal. Since almost all patients suffering from pernicious anemia have a chemically deficient gastric juice—deficient in hydrochloric acid and pepsin—which stimulates pancreatic activity only insufficiently, their appetite and digestion are much impaired. Subjective complaints of sore tongue and mouth, epigastric discomfort or pain, nausea or vomiting, and constipation or diarrhea are so common that it is not surprising that these patients are apprehensive about any attempt to tax their digestive apparatus with any increased quantity of food or with articles of diet which are somewhat unusual and not commonly partaken of. If the patient is unwilling to collaborate it is well to explain to him that there are different means by which a patient's health can be restored: either by medicine and drugs or by surgical operations, or, and this is the case in his condition, by taking the proper foods and nourishment. Kindness and encouragement on the part of an understanding and humane physician and his persistence aided by the conviction of the benefit derived will soon lead the patient to eat the quantities of food inside one day which he frequently scarcely took in one week before the treatment started. The mental attitude of the physician regarding the curability or fatality of the ailment which he is treating is instinctively felt by the patient, transmitted to him and determines his hopefulness or despair. Most physicians consider pernicious anemia still an absolutely fatal disease and place it, as far as curability goes, in the same category as cancer. They are usually satisfied to prescribe dilute hydrochloric acid and arsenic in some form and feel that with these directions they have done everything that can be done for the patient. Such an attitude on the part of the physician, we feel, is never justified; and regarding pernicious anemia we believe that such a prolongation of life at least is today possible in the majority of cases that the term "pernicious" is no longer warranted and certainly should not be used in the sickroom.

The chief difficulty is presented by the fortunately only small number of patients suffering from Addison's anemia who reach the hospital in a moribund, semiconscious or delirious condition. Some of them are in a state of great restlessness and excitement and present a definite state of psychosis. This is frequently the end stage of the disease, and some of these patients die in a few days before the curative diet can be given; for most of these patients can scarcely swallow, or if they are able to swallow, vomit frequently. It is out of the question that patients in this state of the disease take any solid food. But even here an attempt to give a vitamin rich diet in liquid form or, if necessary, by stomach tube meets sometimes with success. Orange juice, eggnogs, wheatgerm extract in orange juice, a liquid liver extract and small quantities of milk will sometimes resuscitate these patients and save a patient from certain death if left to himself. These are the only patients in whom a transfusion might be tried, but here special care must be observed in typing the blood of donor and recipient, since a protein shock in these debilitated patients might prove fatal. In the other patients, who are able to swallow and can take daily from 800 to 1,200 calories for the first few days, no transfusion is given, even if the red cell count and hemoglobin are as low as 15 per cent of the normal. Of the forty-two patients who constitute the material of this report, transfusion has been done in only two since they came under our care.

The aid of a nurse especially interested in dietetic treatment and the active cooperation between a trained dietitian and an intelligent cook are of invaluable aid in accomplishing the improvement of the patient in the shortest possible time. The patients are all kept in bed until their red count is nearly 4,000,000. The general improvement, especially blood regeneration, seems to progress more rapidly if the patient is at complete rest than if he uses his energies for locomotion and exercise. After the patient has been in the hospital for from ten to fourteen weeks, a period that is usually necessary to bring the blood back to normal, the treatment can be carried out at home. Typewritten directions are given the patient, and most of them report every two to three weeks for reexamination.

## MATERIAL AND RESULTS

The material on which this report is based consists of forty-two patients who have been treated now by the vitamin rich, high caloric diet for from six months to two years. Most of these patients were observed and treated in the Cook County Hospital, some in St. Luke's Hospital, and some in the Illinois Central Hospital. Our medical colleagues in these institutions cooperated in the work, and it is in a large measure due to them that this treatment has received such a relatively extensive trial in so short a time.

By far the larger number of our patients, at least 90 per cent, were severely ill when first seen by us. It has been observed with amazement by many other students of this disease, as well as by us, how long a patient suffering from the severest type of pernicious anemia is still able to be around and active at a time when his blood and hemoglobin are perhaps only 20 per cent of the normal. The following figures will give an idea just how severely ill most of the patients of our series were:

Of the forty-two patients ten, or 23.7 per cent, had an initial red count between 550,000 and 1,000,000.

Thirteen, or 30.9 per cent, had an initial count between 1,000,000 and 1,500,000.

Eight, or 19 per cent, had a count of between 1,500,000 and 3,000,000.

Eleven, or 26.2 per cent, had a count of 3,000,000 or more.

## DURATION OF DISEASE

Most of the patients of our series had definite symptoms of the disease for several years or many months before the dietetic treatment was started. Some of the symptoms, as pallor and weakness, numbness and pains in the hands and feet, existed frequently over a year before the condition became so severe that the patient had to come finally to the hospital. One of our patients gave definite symptoms of the disease for more than twelve years; one other for five years; two for four years, and several for more than two years. Many were ailing from one to two years preceding their entrance to the hospital and were unable to attend to their work in the usual way on account of increasing weakness.

### NUMBER OF RELAPSES

More than half the patients of our series had more than one attack preceding our treatment. Of the forty-two patients of the series, twenty were in their first attack of the disease, thirteen had their second, four their third, four their fourth, and one his fifth attack of the disease. This is an important feature, for the power of blood regeneration and recuperation in general decreases proportionately to the frequency of relapses; the immediate prognosis under the common forms of treatment was much more grave in patients who had had several relapses.

### LENGTH OF TREATMENT

Of the forty-two patients, one has taken the diet for more than two years, one for twenty months, eight from one year to eighteen months, thirteen from six months to eleven months, and the rest for less than six months.

All patients have taken the treatment for at least the first two months in a hospital. They are all alive except one, who died suddenly during the remission. No autopsy could be obtained and the immediate cause of death in this patient remains unknown.

TABLE 1.—*The Blood in Case 1* *

| Date | Hemoglobin, Per Cent | Erythrocytes | Icterus Index |
|---|---|---|---|
| 5– 5–27 | 35 | 560,000 | 37.5 |
| 5– 9–27 | 35 | 1,120,000 | .... |
| 5–10–27 | 35 | 1,200,000 | .... |
| 5–18–27 | 45 | 1,300,000 | .... |
| 5–23–27 | 55 | 2,800,000 | 15.5 |
| 6– 9–27 | 80 | 3,260,000 | .... |
| 6–28–27 | 85 | 4,040,000 | 12.0 |

* Matilda S.; first attack of disease; diet started May 5, 1927.

TABLE 2.—*The Blood in Case 2* *

| Date | Hemoglobin, Per Cent | Erythrocytes |
|---|---|---|
| 4– 3–26 | 19 | 1,390,000 |
| Diet started | | |
| 4–21–26 | 25 | 1,120,000 |
| 4–29–26 | 30 | 1,340,000 |
| 5–13–26 | 38 | 1,450,000 |
| 5–28–26 | 48 | 2,100,000 |
| From then on the patient improved steadily, and he showed a normal blood count in July, 1926, which has remained so to this day | | |
| 7–20–26 | 80 | 4,010,000 |
| 11– 4–26 | 98 | 4,850,000 |
| 12–12–26 | 95 | 4,680,000 |
| 12–31–26 | 100 | 4,970,000 |

* J. J., a patient who had the fourth relapse when he came under our care.

### OBJECTIVE AND SUBJECTIVE SIGNS OF IMPROVEMENT

From two to three weeks after the high vitamin diet had been started, the beginning of a definite remission could be observed in every one of the forty-two patients. In the first ten days no numerical changes in the blood count may be observed, and also the hemoglobin might remain stationary at this time. But other signs of active and altered blood regeneration in the bone marrow can be demonstrated by a careful study of the blood. Polychromatophilic cells and the reticulocytes, both immature "youthful" erythrocytes, appear in increasing number and continue to increase during the first week of the remission. We have observed some counts of red cells showing the substantia granulofilamentosa, i. e., reticulocytes, in as high as 23 per cent as compared with 2 per cent before the diet was started. In two weeks the number of these cells again usually reaches the figure commonly found in the normal blood. The number of normoblasts occasionally increases during the first few days after the diet has been started, but very soon they decrease and disappear completely from the blood in a few weeks in every instance.

The increase in the red cell count and in hemoglobin varies in different patients. The patients who had several relapses seem to take a week or so longer to show onset of the remission; the ones who had their first attack of the disease begin to show an increase in erythrocytes usually after the first week of treatment.

A definite increase in the red count or hemoglobin or both occurs in all patients at the end of the second week or during the third week. The red cell count of all forty-two patients was between four and five millions in from eight to fourteen weeks after the dietetic treatment had been started. Eleven of the forty-two patients showed a blood count above five million. All patients have been repeatedly examined since the optimum count and hemoglobin has been reached, and all have been seen during the last two months. Four of them had, when last seen, a blood count somewhat below four million, one of them just 3,500,000. These four patients did not keep up the diet but had reverted to their former faulty eating habits because of economic considerations. Since the greater number of our patients are people of very moderate means, it necessitates a constant effort on the part of the physician and the workers of the social service department of the hospital to have them continue the dietary regimen at home and while at work.

The lowest red blood count observed in any of our patients was 550,000. This patient was in his first attack and this low count was observed, Nov. 30, 1926. Jan. 14, 1927, the red count was 4,400,000 and the hemoglobin 100 per cent. March 1, the red count was 5,280,000. His blood is normal at the present time in every detail.

The highest red count and hemoglobin were observed in a patient after treatment for three months. He had had his third attack. His blood count was 6,200,000 and the hemoglobin 21.7 Gm., or 127 per cent.

The changes in the leukocytic formula of the blood too are of interest, for they show that the leukopoietic tissue in the bone marrow is as much affected by the diet as the erythroblastic tissue. The leukopenia so commonly present in pernicious anemia disappears gradually, and during the active remission of the first two to three months after the treatment has been started, white counts above normal may be observed occasionally. The relative lymphocytosis usually found in pernicious anemia frequently disappears completely and the normal percentage of polymorphonuclears is established when the remission is complete. This normal relationship between the granulocytes and the lymphocytes in the blood usually persists from then on. One patient, W. B., might illustrate this point (table 3).

TABLE 3.—*The Blood in Patient W. B.*

| Date | Hemoglobin, Per Cent | Erythrocytes | Leukocytes | Polymorphonuclears, Per Cent | Lymphocytes, Per Cent |
|---|---|---|---|---|---|
| 8–19–26 | 37 | 1,300,000 | 3,600 | 39 | 60 |
| 9– 6–26 | 55 | 2,710,000 | 5,600 | 56 | 40 |
| 10–12–26 | 95 | 4,400,000 | 7,600 | 62 | 32 |
| 10–26–26 | 95 | 4,920,000 | 11,000 | 79 | 18 |
| 11– 4–26 | 109 | 5,100,000 | 9,200 | 75 | 22 |

The increase in the erythrocytes and hemoglobin to normal values, and the gradual disappearance of polychromatophilic cells, or reticulocytes, megalocytes and of anisocytosis and of erythroblasts, is evidence that new blood formation is taking place and that this regeneration seems to proceed again in normal channels.

That blood destruction ceases under the influence of the high vitamin diet is suggested by the quantitative determination of the concentration of bile pigments in the blood serum.

The quantitative determination of the bilirubin according to the technic of Meuleugnacht-Bernheim [5] is the routine method employed in our work.

At the beginning of the treatment the subicteric, waxy and often brownish tint of the patient's skin is visible evidence of the increased amount of bile present in the blood serum of the capillaries and cells of the skin. It is not uncommon to find a dark brownish color suggestive of hemochromatosis. At this time the icterus index is markedly increased, ranging usually from 8.0 to 20.0. In the first case cited, the icterus index was the highest observed in any of our forty-two patients, 37.5. It is seen that as the patient's red cell count increases, the concentration of biliary pigment, derived from destroyed blood cells, decreases. This is found in almost all cases examined, but the decrease is frequently a more gradual one and not always as prompt. The change in the patient's color soon becomes evident.

The subjective signs of improvement on the part of the patient are very definite. A feeling of warmth and comfort is felt a few days after the diet has been started. The patient, who shortly before was apathetic, takes renewed interest in his environment and in life. He himself observes the change of color of his skin, he desires to get up and to leave the bed and his appetite improves. It has been frequently stated that patients with uncomplicated pernicious anemia are not emaciated and do not lose weight. This seems to us rather the exception than the rule. And this is what one would expect, as the diet which is qualitatively deficient is most frequently also deficient in calories, for the appetite of patients suffering from pernicious anemia is most commonly very much impaired.

### IMPROVEMENTS ON THE PART OF THE NERVOUS SYSTEM

About 80 per cent of our patients showed some form of involvement of the nervous system. The most common symptoms were weakness in the legs, and numbness and tingling in the fingers and toes. These acroparesthesias were frequently of an ascending character associated with areas of hyperesthesia and hypalgesia in the extremities. Several patients showed ataxias of a varying severity, some of the upper, but more frequently of the lower extremities, simulating tabes.

The effects of the vitamin rich diet on these symptoms of the pseudosystemic combined degeneration of the spinal cord are often very remarkable. Not only the subjective symptoms, as formications and numbness, decrease or disappear completely after several months' treatment, but also objectively improvement can be demonstrated in the diminution or disappearance of the areas of hyperesthesia or anesthesia. Even the atactic, paretic symptoms decrease, and some patients who were completely unable to walk alone have improved so that they learned to walk again. Dr. Roy Grinker, attending neurologist at the Cook County Hospital, supplied a detailed neurologic report on two patients, both of whom had been unable to walk before the high vitamin diet was started and now after several months of treatment are walking again.

C. H., a woman, aged 64, had been troubled with constipation for six years, sharp pains in the leg and left chest, profound weakness for three months, anorexia for three months, marked loss of weight for three months, and belching after meals for one year.

Physical examination revealed marked generalized weakness. There was a lemon tint to the skin. The pupils reacted to light and in accommodation; they were equal and circular. The cranial nerves were normal. There was marked decreased power in the legs. The vibration sense was absent in the lower extremities. There was a decreased sense of position in the legs. The pain sense was normal. The sense of touch was decreased in ill defined, scattered areas. The knee jerks were present, the right greater than the left. The achilles reflex was absent on both sides. The upper extremities were normal in all respects.

Laboratory examination showed the spinal fluid clear, colorless, with 14 cells and round cells. The Nonne, Ross-Jones, Lange, and Wassermann tests were all negative. The blood Wassermann reaction was negative.

The Ewald test meal showed free acid, 0; total, 5; no lactic acid; no blood. Examination of the urine showed a trace of albumin; no casts; a weekly examination was made. The stools were negative for blood, on weekly examination. The systolic blood pressure was 130; diastolic, 80. A roentgenogram of the colon was negative.

Blood counts, Jan. 3, 1927, gave 3,330,000 erythrocytes (69 per cent polymorphonuclears, 25 per cent lymphocytes, 6 per cent large mononuclears; no abnormal reds).

| | |
|---|---|
| January 7: 3,390,000. | January 28: 3,380,000. |
| January 13: 3,100,000. | February 5: 3,320,000. |
| January 20: 2,980,000. | February 14: 3,280,000. |
| January 24: 3,500,000. | March 8: 2,800,000. |

From January 1 to April 1 the patient was on Koessler's diet with hydrochloric acid, cod liver oil and sedatives. On being discharged she remained in bed at home for six weeks and then was up and around, walking without aid and feeling much stronger.

May 11, the hemoglobin was 90 per cent; erythrocytes, 4,200,000.

There was no ataxia. The vibration sense was absent only in the feet. Reflexes were as before.

E. J., a woman, aged 40, had suffered from weakness one year and pain in the lower extremities one year. In South Africa in 1924 for six weeks she had diarrhea, chills and fever, and lost 40 pounds (18 Kg.). In 1925 in Chicago she had headache, chills and fever for one day. She took to bed for five weeks; she was very sleepy; she did not have fever or diplopia. She had had progressive weakness since then, with numbness in arms and legs.

Sept. 22, 1926, the patient was unable to walk. The right hand was useless (numb). There was numbness from the waist down. There was difficulty in controlling the urine (urgency).

The patient had been married twenty years; the husband and three children were alive and well. She had had six miscarriages, some induced, others spontaneous (?).

September 24, the spleen was palpable. There was hypertonicity of the legs. The deep reflexes were exaggerated. There was bilateral, ill sustained ankle clonus and weakness in the legs; loss of deep sensation in the legs; anesthesia (incomplete) to touch and pain in the legs, and an ataxic gait.

December 18, the muscle power in the legs was fair; the left greater than the right. There was bilateral ankle clonus and right patellar clonus. The sense of position in the legs was poor; in the toes, normal. The upper extremities were normal. Pain sense was normal. Touch was not quite normal. A note states that "examination reveals the most remarkable improvement in sensation and muscle power; believe with continued therapy directed against primary etiologic agent of cord degeneration (avitaminosis) that continued improvement in cord symptoms may take place or that reeducational exercises may enable patient eventually to walk."

Jan. 4, 1925, the flexor and extensor of the legs and feet were strong; adduction and abduction were poorly performed. The patient could sit up without flexing the lower extremities. The hands and arms were normal. There was marked ataxia of the lower extremities, the right greater than the left. There was loss of joint sensation in the legs. The ankle jerks were increased, the left being greater than the right. There was ankle clonus on the right, less on the left. The

5. Bernheim, Alice R.: The Icterus Index (A Quantitative Estimation of Bilirubenemia), J. A. M. A. 82: 291-295 (Jan. 26) 1924.

knee jerks were brisk. There was bilateral knee clonus. There was a Babinski tendency on the right. The abdominal reflexes were absent. The pupils were normal. Pain and touch were normal. The vibration sense was lost to 8 D.

September 9, the hemoglobin was 60; erythrocytes, 3,590,000; leukocytes, 11,300; polymorphonuclears, 58 per cent; lymphocytes, 36 per cent; large mononuclears, 5 per cent. There was variation in the size and shape of the red cells.

The gastric contents showed free acid, 0; total, 7.

The stools and the urine were normal. The spinal fluid showed 6 lymphocytes; it was negative to the Lange and Wassermann tests. The blood Wassermann reaction was negative; the blood reaction was negative also after a provocative injection of neoarsphenamine.

September 25, hemoglobin was 70 per cent; erythrocytes, 3,200,000; polymorphonuclears, 54 per cent; mononuclears, 30 per cent; transitionals, 8 per cent; eosinophils, 2 per cent.

November 2, hemoglobin was 75 per cent; erythrocytes, 4,160,000; polymorphonuclears, 72 per cent; mononuclears, 22 per cent; transitionals, 4 per cent; eosinophils, 2 per cent.

There was slight poikilocytosis and anisocytosis each time.

Jan. 20, 1927, the patient was discharged from the hospital after four months of the Koessler diet. For several weeks prior she had had Fraenkle's reeducational exercises. Treatment and exercises were continued. The patient was examined twice monthly.

June 1, 1927, the patient felt fine and strong. She was walking without support on a broad base. There was marked ataxia. The deep reflexes were exaggerated. There was right ankle clonus; no other clonus. Pain and touch were normal in the legs. There was moderate hypertonicity in the legs. Vibration sense was decreased but felt in the legs. There was no Babinski reflex. Erythrocytes numbered 4,150,000; hemoglobin, 82 per cent; leukocytes, 8,150.

## COMMENT

The high caloric diet, consisting of foods especially selected for their high content on vitamins, has been used by us in the treatment of pernicious anemia during the last two years.

The reasons, based on clinical observation, experimental work and theoretical consideration, which led to the adoption of this diet, have already been discussed,[1] and a detailed list of the foods to be used and their quantities given. We recommend that meat is best given in the form of liver and kidney since they contain by far the largest amount of vitamins A and B (and also some C).

At the time of our previous article, Minot and Murphy [6] published a paper on the treatment of pernicious anemia by a special diet. Whipple and Robscheit-Robbins [7] had shown that, in secondary anemia produced in dogs by repeated bleedings, blood regeneration is most promptly brought about by the feeding of liver. On the basis of this experimental work, Minot and Murphy started to use liver in the treatment of patients suffering from pernicious anemia. In the article quoted they reported beneficial results in forty-five patients treated by a diet rich in liver and low in fats.

Until very recently we were of the opinion that the effect of the liver on blood regeneration, first demonstrated by Whipple and his collaborators, was due to the large amount of vitamin A (and B) contained in this organ. Steenbock [8] as well as Coward [9] and Goldblatt [10] and their co-workers have shown that the liver is the chief storage organ of the mammalian organism for vitamin A.

Cohn and Minot,[11] in association with others, describe in a paper on the nature of the material in liver effective in pernicious anemia how they prepared by successive extraction with water, alcohol and ether a liver extract which was apparently free from vitamins and yet seemed to have a definite effect on accelerating blood regeneration in the patients. It is not evident thus far from their work whether this extract is active and of any lasting benefit in the absence of vitamins from the diet, but their work suggests that the liver contains a substance, not a fat soluble vitamin, which stimulates the new formation of blood. Our own experimental work suggests that the fat soluble vitamins are a factor of primary import in blood regeneration. We could show that the addition of vitamin A to the diet of animals long depleted in their vitamin A reserve brings about rapid formation of new blood cells, and we were able to produce by deprivation of vitamins a condition in the experimental animal similar to the pernicious anemia of man. The clinical analysis of our patients suffering from pernicious anemia leaves little doubt that a definite relationship exists between a state of chronic vitamin deficiency and the anemia and the spinal cord changes. It therefore seems advisable to adhere to the high vitamin diet and include in it, as we recommended originally, as the best forms of meat rich in vitamins, liver and kidney and the other edible viscera. Although there is no doubt that the liver contains a substance which stimulates blood regeneration, liver alone in the absence of ample vitamins will not lead to a permanent lasting result. The vitamins are absolutely essential for the patient to retain the improvement when once accomplished. The recommendation of Minot and Murphy of a diet low in fat is not justified and should be abandoned. Butter, cream, milk and cod liver oil are supreme sources of fat soluble vitamins and should be partaken of in large amounts. (In addition, very few organs are as rich in fats as liver, kidney and brains.)

The use of a concentrated active liquid liver extract [12] is a very useful aid in feeding patients suffering from pernicious anemia who are unable to swallow solid food. But such an extract cannot and should not replace the feeding of total well cooked liver, for the latter contains a large amount of vitamins.

When liver extract free from fat-soluble vitamins is fed, a liquid concentrate of vitamins prepared from wheat embryo is also given frequently in orange juice, to supply an ample amount of all known vitamins and rapidly to reestablish a normal vitamin balance and storage. Eggnogs and milk should be added to supply the necessary calories to this type of patient in a liquid, easily assimilable form, until the patient is able to take solid food.

## SUMMARY

1. The history of patients suffering from pernicious anemia frequently suggests a faulty mode of nourishment deficient in essential foodstuffs, vitamins, over a long period of years.

2. A high vitamin, high caloric diet, furnishing the meats chiefly in the form of liver, kidney and other edible viscera, has been used in the treatment of forty-two patients suffering from pernicious anemia.

3. The use of this diet is followed promptly in each instance by a remission, which leads to a normal blood

6. Minot, G. R., and Murphy, W. P.: Treatment of Pernicious Anemia by a Special Diet, J. A. M. A. **87**: 470 (Aug. 14) 1926.

7. Whipple, G. H., and Robscheit-Robbins, F. S.: Blood Regeneration in Anemia, Am. J. Physiol. **72**: 408 (May) 1925.

8. Steenbock, Harry; Sell, M. T., and Nelson, E. M.: Storage of the Fat Soluble Vitamin, J. Biol. Chem. **58**: 327 (June) 1923.

9. Coward, K. H.; Lush, Joan H., and Palmer, M. Grace: Lancet **1**: 124 (Jan. 20) 1923.

10. Goldblatt, H., and Soames, K. M.: Biochem. J. 17: 446, 1923.

11. Cohn, E. J., and Minot, G. R.: Paper read before the Federation of the American Societies for Experimental Biology, Rochester, N. Y., April, 1927.

12. Such a preparation, used by us, has been put out for trial use by physicians by Armour and Company's research laboratory.

picture in from eight to fourteen weeks. The subjective as well as objective improvement of the patients is striking.

4. The recommendation of a diet low in fat is not justified by experimental and clinical evidence and would rob the patient of a most valuable source of vitamins.

5. The possible relation of the subacute combined degeneration of the spinal cord to vitamin B deficiency is reemphasized and illustrated by the objective improvement of the nervous symptoms in two patients.

6. All patients with the exception of one are alive today and are in good health and show a qualitatively and quantitatively normal blood picture.

7. In patients who are unable to eat solid food, the use of a liquid liver extract combined with a liquid concentrate of vitamin prepared from wheat embryo and given in orange juice, is of advantage.

8. The high caloric diet, rich in vitamins, furnishing meat in the form of liver, kidney and other edible viscera, seems to be a procedure of decided benefit in the treatment of patients suffering from pernicious anemia. While it is still too early to state that the benefit derived from that treatment leads to a permanent cure of these patients, it can be safely said that it brings about a definite prolongation of life.

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## A STUDY OF THE SKIN IN FIVE HUNDRED CASES OF DIABETES *

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This paper is a study of the dermatologic conditions found in 500 diabetic patients of Dr. Elliott P. Joslin and Dr. F. Gorham Brigham. It was undertaken so that we might know more of the skin conditions to be expected in diabetes, and also because of the comparatively recent writings relative to the association of hyperglycemia and skin disease. It seemed reasonable to assume that we should find an abnormally high incidence of skin diseases in diabetic patients if high blood sugar has any connection between them other than coincidental, or as part of a complex of other conditions. The blood sugar average of these cases done by the Folin-Wu method was 0.19, well above the normal, whose upper limit is generally considered to be 0.11 per cent.[1]

Textbooks [2] on diabetes mention the following skin complications as commonly present in diabetes, and generally assume these to be due to hyperglycemia: dry skin; pruritus; chronic urticaria; eczema; perforating ulcer; xanthoma diabeticorum and a whole group of infections, such as impetigo; furuncles; ecthyma; paronychia; epidermophytosis; trichophytosis, and yeast infections. There has been apparently little experimental support for the assumption that hyperglycemia is responsible for the frequency of these conditions. Experiments in vitro showed that blood to which from 0.5 to 1 per cent dextrose was added was not a better culture medium for staphylococcus than normal blood, and that adding dextrose did not diminish the blood's bactericidal powers.[3] Theobald Smith [4] found sugar harmful to pus cocci. Handmann concluded that the problem was cellular and not humoral; but whether the cellular injury is due to hyperglycemia has not been proved. There are apparently many statements and assumptions on the subject without experimental or laboratory support. For instance, von Noorden [5] says:

> It is an old observation borne out by practical experience that most of the skin complications of diabetes depend upon the presence of sugar in the blood, and that a rational treatment of the glycosuria is more effective than the usual remedies applied to the skin. This holds good particularly in eczema, pruritus, disordered perspiration, xanthoma and trophic lesions of all sorts.

The present status of the connection of hyperglycemia and skin disease seems to be this: Some observers have found in making sugar determinations on patients already having skin disease that many, but not all, the results indicated a blood sugar above normal,[6] and that in some of these the symptoms improve with reduction of the blood sugar. On the other hand, others, in a similar series, did not find a significant deviation from the normal blood sugar content.[7] It is evident that many more observations must be made before definite conclusions can be reached. Recently, G. A. Talbert and S. H. Silvers [8] of the University of North Dakota reported that they had discovered sugar in the sweat in every instance in twenty-eight different determinations on nondiabetic persons. In these experiments the sweat was found to contain from 5.6 to 40 mg. per hundred cubic centimeters. The average was about 15 mg. per hundred cubic centimeters. It is possible that future investigation in these lines will have important bearings on the etiology of skin disease.

Palmer,[9] in 1917, reported comparative figures for concentrations of sugar in the blood and skin of diabetic dogs. In these figures the skin sugar was never more than 50 per cent of the blood sugar and in most instances much less.

H. C. Trimble [10] of the Medical School of Harvard University, who has recently worked on the concentration of sugar in the skin of nondiabetic dogs, says:

> In fasting dogs the concentration of sugar averages 65 mg. per hundred grams of skin when the blood sugar averages from 80 to 90 mg. per hundred cubic centimeters. When glucose is injected intravenously into dogs, the concentration also rises and reaches a numerical value only slightly lower per hundred grams of skin than that found per hundred cubic centimeters of blood. Samples of skin taken at various intervals after injections show that the sugar concentration of the skin and of the blood fall off in a nearly parallel manner. The concentration in the skin is always slightly under that in the blood.

* Read before the Section on Dermatology and Syphilogy at the Seventy-Eighth Annual Session of the American Medical Association, Washington, D. C., May 20, 1927.

1. McGlasson, I. L.: Hyperglycemia as an Etiologic Factor in Certain Dermatoses, Arch. Dermat. & Syph. **8:** 665 (Nov.) 1923. Gray, Horace: Blood Sugar Standards: I. Normal and Diabetic Persons, Arch. Int. Med. **31:** 241 (Feb.) 1923.

2. Joslin, E. P.: Treatment of Diabetes Mellitus, ed. 3, Philadelphia, Lea & Febiger, p. 590. Allen: Glycosuria and Diabetes, Cambridge, Harvard University Press, p. 136. Von Noorden: Metabolism and Practical Medicine, Chicago, Chicago Medical Book Company, **3.**

3. Handmann, E.: Deutsches Arch. f. klin. Med., 1911, pp. 102, 1-14. Bujwed: Zentralbl. f. Bakteriol. u. Parasitenkunde **4:** 577-578, 1888.

4. Smith, Theobald: Centralbl. f. Bakt. **18:** 1-9, 1895.

5. Von Noorden: Metabolism and Practical Medicine, p. 785.

6. McGlasson (footnote 1). Hudelo, L., and Kourilisky, R.: Hyperglycemia Without Glycosuria in Skin Diseases, Presse méd. **34:** 1041 (Aug.) 1926. Lortat-Jacob, L., and LeGrain, P.: Medicine **7:** 746 (July) 1926. Lortat-Jacob, L., and Bourgeois, P.: Bull. et mem. Soc. méd. d. hôp. de Paris **50:** 621 (April) 1926. Haldin-Davis, H., and Wills, L.: Abnormalities of Blood Sugar Content in Eczema, Brit. J. Dermat. **37:** 364 (Sept.) 1925.

7. Schwartz, Highman and Malinkin: The Sugar Content of the Blood in Various Skin Diseases, J. Cutan. Dis. **34:** 159 (March) 1916. Schamberg, J. F.: Personal communication to the author.

8. Talbert, G. A., and Silvers, S. H.: Personal communication to the author.

9. Palmer, W. W.: J. Biol. Chem. **30:** 79 (May) 1917.

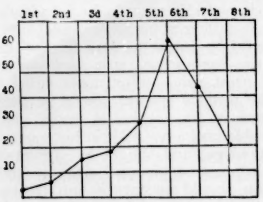
10. Trimble, H. C.: Personal communication to the author.

Summarizing these observations, sugar is present in the sweat of diabetic and nondiabetic persons. In diabetic and nondiabetic dogs, sugar is present in the skin in amounts always under the blood sugar concentration but varying directly with it. In the meantime it would seem plausible that if there is a definite etiologic connection between skin disease and hyperglycemia 500 patients, all having high blood sugar, should show a higher percentage of skin diseases than is shown in the general run of outpatient cases. Naturally, such a method is open to many objections. I can only offer the figures as showing the percentages that were found in these cases of diabetes, and as suggesting what skin diseases diabetic persons are most likely to have.

TABLE 1.—*Incidence of Skin Diseases in Diabetes*

| By Decades | Number | Per Cent |
|---|---|---|
| First | 11 | 2 |
| Second | 47 | 9 |
| Third | 38 | 7 |
| Fourth | 41 | 8 |
| Fifth | 61 | 10 |
| Sixth | 140 | 28 |
| Seventh | 110 | 22 |
| Eighth | 31 | 6 |

Of the patients examined, 194 (39 per cent) were males and 306 (61 per cent), females; 124 patients (25 per cent) gave a history of skin disease, and 368 (75 per cent) said that they had never had any trouble with their skin; i. e., in 500 cases one out of four diabetic patients has had enough trouble with the skin to have it register on the memory.



Epidermophytosis by age groups.

Thirty-three cases of pruritus either in the present or past were recorded; i. e., approximately one patient in fifteen has pruritus, either local or general. Of these cases, seventeen (51 per cent) were local, and sixteen (49 per cent) were general.

In 115 cases (26 per cent) the skin was dry; in 327 (74 per cent) it was moist. This item was not recorded in the first cases examined, so that the total is less than 500. Forty-three per cent of the patients with dry skins had skin disease, and 29 per cent of those with moist skins had skin disease.

TABLE 2.—*Pruritus*

| | Local Cases | | General Cases | |
|---|---|---|---|---|
| | Number | Per Cent | Number | Per Cent |
| Male | 2 | 12 | 5 | 31 |
| Female | 15 | 88 | 11 | 69 |

EPIDERMOPHYTOSIS

There were 198 cases of epidermophytosis of the feet, including all types; i. e., about 40 per cent. In 155 (79 per cent) of these the patients were in the last four decade groups—during the time when foot infection in diabetes is most serious. Roughly, one out of every two had fungus infection of the feet after 20 years of age.

Hulsey and Jordan [11] found 67 per cent of university students affected with epidermophytosis. This is higher than the percentage in my whole group, which includes the first two decades, but corresponds closely if the same age groups are taken. Only 2.5 per cent of my patients in the first two decades were affected. My figures for the whole group are considerably higher than those given by Butler,[12] which are 13.2 per cent for a group of 500 men in the U. S. Naval Service.

TABLE 3.—*Comparison of Occurrence of Dermatoses in Diabetes in Two Series*

| Disease | Diabetic Patients | | Massachusetts General Hospital, per Cent | Lane, per Cent |
|---|---|---|---|---|
| | Number | Per Cent | | |
| Furunculosis | 7 | 1.4 | 0.9 | 0.24 |
| Carbuncle | 3 | 0.6 | 0.12 | 0.2 |
| Erysipelas | 2 | 0.4 | 0.04 | 0.11 |
| Psoriasis | 12 | 2.4 | 0.23 | 0.1 |
| Eczema | 14 | 2.8 | 4.0 | 0.5 |
| Epidermophytosis | 198 | 40.0 | 0.8 | .... |
| Seborrheic dermatitis | 1 | 0.2 | 0.27 | 0.2 |
| Xanthoma palpebrarum | 9 | 1.8 | 0.02 | .... |
| Dupuytren's | 8 | 1.6 | 0.016 | .... |

I have placed in table 3 the percentages and numbers of some of the dermatoses found in my series, comparing them, in parallel columns, with the figures obtained from the outpatient department of the Massachusetts General Hospital for 1926, and with those of C. G. Lane from a general practice.

It will be seen that in this group of 500 diabetic patients furunculosis, carbuncles, erysipelas, psorsiasis, epidermophytosis, xanthoma palpebrarum and Dupuytren's contraction show higher percentages than are found in the other groups. The percentage of eczema is lower than the hospital figures, but higher than Lane's. I believe that the figures in the hospital series for epidermophytosis and xanthoma palpebrarum are much below the correct frequency. The diagnosis of these conditions is not likely to be made by departments other than the dermatologic.

TABLE 4.—*Incidence of Dermatoses in Entire Series of Author's Cases*

| | Number | Per Cent |
|---|---|---|
| Furunculosis | 33 | 6.6 |
| Carbuncle | 9 | 1.8 |
| Erysipelas | 5 | 1.0 |

If figures for all the diabetic patients in this series who give a history of funuculosis, carbuncles and erysipelas are considered, the percentages are still higher, as shown in table 4. I do not have a similar series with which to compare these figures.

The percentage of skin disease of all kinds found in these 500 cases was 11.4 per cent. A similar figure from the Massachusetts General Hospital is 10 per cent, and from Lane, 5 per cent.

It is curious that Dupuytren's construction should apparently be more frequent in diabetes. I was struck by its frequency in examining the patients, and was surprised to find that von Noorden mentions it as occurring more often in diabetic persons than in others. I cannot see any explanation of the fact.

11. Hulsey, S. H., and Jordan, F. M.: Ringworm of the Toes as Found in University Students, Am. J. M. Sc. **169**: 267 (Feb.) 1925.
12. Butler, C. S.; Houghton, J. E., and Cooper, G. E.: Mycosis of the Hands and Feet, U. S. Nav. M. Bull. **21**: 615 (Nov.) 1924.

CONCLUSIONS

I am quite aware of the defects of such a study as this, but, if any conclusions may be drawn, it at least suggests the following as to the average diabetic patient:

1. The diabetic patient shows a higher incidence of skin infection than do other persons.

2. He shows a higher incidence of skin disease than others.

3. He shows about the same liability to fungus infection, but this infection occurs at a time and in locations which are particularly dangerous in diabetes, as furnishing a starting point for more serious conditions.

4. Diabetic patients in general do not have dry skins, but if a dry skin is present it is twice as liable to infection as the normally moist one.

5. Pruritus seems probably more frequent in diabetic patients. Women are considerably more liable to be affected both locally and generally than men.

6. It seems possible that hyperglycemia is a factor in the etiology of certain skin diseases.

Finally, we are evidently justified in warning every diabetic patient that he is more liable than others to skin disease, particularly if he has a dry skin, and that his feet, so commonly infected by fungus diseases, must be looked after with more than ordinary attention.

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ABSTRACT OF DISCUSSION

DR. C. GUY LANE, Boston: Dr. Greenwood has had an unusual opportunity for studying these cases in the rather large diabetic clinic of Dr. Joslin and Dr. Brigham, where unusually careful dietetic, chemical and clinical studies have been made. The uniqueness of these figures is borne out by a comparison with other studies. Both the Massachusetts General Hospital figures and my figures include individuals coming for treatment on account of complaints of the skin, and show little of the actual frequency of disease, while Greenwood's figures show the actual frequency in diabetic persons. The figures from Hazen are taken from the American Dermatological Association statistics and show the comparison with other skin conditions, but not the actual occurrence of skin disease. Other figures which he mentioned are those of certain rare groups, and it is difficult to find figures for comparison. It is worth emphasizing that the blood sugar figures in the studies of McGlasson have to do with cases which rank 0.11 or 0.12 at the most, and here we are dealing with an average of 0.19, a much higher concentration of blood sugar than in the other group. Only 25 per cent of these patients give a history of some previous skin condition, and that history, of course, is unreliable because 40 per cent show fungus infection; this figure runs up to 80 per cent in persons over 40. The fact that the feet are of so much importance in diabetic persons has resulted in the establishment at the Deaconess Hospital of a foot beauty parlor. There is a nurse in charge who makes appointments for patients, or goes to their rooms if they are confined to bed. It is a clinic in which patients are taught to care for their feet in order to avoid sores and complications later, and also a place where those treatments may be given which are prescribed by their physicians. I believe that this study is of importance and that it will be of interest to follow the patients and see whether their skin conditions improve with an improvement in the diabetic condition. I think it would be well to carry out further similar studies on gymnasium and athletic association groups to determine the frequency of epidermophytosis, and perhaps study other groups of patients, such as those with nephritis, to see how they compare with the diabetic persons with respect to skin disease.

DR. ARTHUR M. GREENWOOD, Boston: The reason we pay so much attention to the feet is that they so frequently give rise to surgical complications, and we treat these patients with fungus infection to try to do away with the starting point of these complications.

## STANDARDS IN ROENTGENOLOGY *

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Roentgenology has won a place for itself in the diagnosis and treatment of disease until it has now come to be recognized as an important specialty. It is therefore appropriate that the Section on Radiology consider what is to be expected of the members of this new branch of medicine.

As the students of today are the physicians of tomorrow it is fitting that this section discuss the problem of standards of teaching roentgenology to medical students. Since the various bodies governing medical education have definitely assigned in the curriculum the number of hours proportionate to the importance of roentgenology, it is proper that there should be presented to the various teachers a comprehensive plan for the employment of these hours. Their task is to make the medical student of today acquainted with the established facts in roentgen-ray diagnosis and in roentgen-ray therapy, so that his future patients may derive the maximum good.

In some colleges the course in roentgenology consists simply of lectures in either the junior or the senior year, illustrated by lantern slides; the subject is sometimes presented in a perfunctory manner and in a way not always calculated to arouse the interest of the student. For quite a few years roentgenology was considered an art, the practice of which was limited to a few. This has changed and now the more important basic facts of roentgen-ray diagnosis and therapy can be so plainly and concisely stated that their applications and limitations will be understood by future medical men. The roentgen ray, like the stethoscope, is a tool whose intelligent use is of great value. For many years I have insisted that the medical student should become familiar with this tool in his preclinical work. He should, as far as possible, make use of it in his courses in anatomy and physiology, and should be presented with a roentgenologic point of view of anatomy and physiology. The plan should encourage him to use roentgenographic methods in the study of anatomy, so that he will have a wider conception of this important primary subject. It is indeed most fortunate that some of our prominent anatomists, such as Bardeen, Huber and Todd, are cooperating in a striking fashion. The physiologists, it is to be feared, have not been as interested, but it is to be hoped that they will follow the example of Dr. Meek.

In teaching the concepts of clinical roentgenology it seems better for the instructor to confine his statements to the important facts and not to stray aside into the consideration of problems which properly are of interest to the expert.

It would therefore be of prime importance that the undergraduate curriculums in roentgenology be taught in a fairly uniform way in the medical colleges. One of the first steps in the attainment of this standard is the insistance on each college having a separate chair of roentgenology.

It is unfortunate that some of the leaders in roentgenology have seen fit to belittle the importance of roentgenologic technic. One has merely to study the roentgenograms which have been handed in to the Sarcoma Commission to realize that the roentgenologist

* Read before the Section on Radiology at the Seventy-Eighth Annual Session of the American Medical Association, Washington, D. C., May 20, 1927.

has not offered in this large series of cases the very best which could be done. In the production of a roentgenogram, certain physical forces of nature are employed, and the laws which govern their applications are seemingly not as yet well understood. It is not too much to expect that a certain technical standard of excellence should be attained and maintained. The standard, which can easily be met, is based on time, milliamperage and kilovoltage. The pathologist who expects to make a positive diagnosis in an important case would be foolish to be content with poorly stained and thick sections; so, on the other hand, the roentgenologist should not be content with films which do not show maximum diagnostic detail and contrast. It is not too much to hope that standards of exposure in chest films may be established. This would be a first step in classifying shadows of normal and abnormal densities. At present many dialects are spoken in discussing thoracic roentgenograms. It is hard to compare lung films made according to varying technic.

### STANDARDS IN THE EDUCATION OF THE ROENTGENOLOGIST

The preliminary education of the roentgenologist presupposes a thorough grounding in physics and chemistry, a mastery of anatomy and an adequate hospital training in medicine and surgery. Perhaps the most important of the basic subjects is pathology. Unless one understands the A B C of pathologic changes, one cannot visualize the densities that should result from the change.

Now that roentgen-ray diagnosis has advanced beyond the primitive period of fractures and foreign bodies, the qualifications of the roentgenologist have accordingly passed the earlier stage of photography. Unfortunately there still exists in the minds of some of the laity and of some practitioners an idea that the mere possession of a roentgen-ray machine clothes the owner with a miraculous cloak conferring on him the power of diagnosis. One of the problems which confronts the radiologic profession is that of elevating its standard and protecting the public from the pretenders who are a menace to the general profession and to the general public. One thoughtful diagnostician recently made the statement that he did not pay any attention to a roentgen-ray report unless he knew that the writer of the report was qualified. This distrust on the part of the profession is becoming too well known, especially in the question of chest and gastro-intestinal diagnoses.

While, perhaps, it is not practical to specify the amount of time which the would-be roentgenologist should spend in preparation for his life work, still it would seem that he should present proof that he is qualified to practice his specialty. This proof should be based on both a written and a practical examination on the basic principles and applications of the art. It is, perhaps, difficult to enforce the taking of such an examination, and its adoption will have to be brought about by the gradual steps of progress. Obviously, the time is not ripe for state laws on this subject. If the universities of the country would unite in standardizing their courses of postgraduate study and would give a diploma in roentgenology to those who fulfil the requirements, much would be accomplished. The University of Cambridge, England, has set a shining example in this respect to our American universities. Before such a change comes about, however, because some university faculties are ultraconservative, the leading special societies in roentgenology in this country could nominate a joint commission which would give a practical and written examination to all who apply for membership in the various special societies.

It is interesting to note what is being done in the other specialties. The leaders in otolaryngology and ophthalmology have recognized that they were confronted with the same problem and it is instructive to see how they have set about solving it. In otolaryngology there are four leading societies which, with the Section on Laryngology, Otology and Rhinology of the American Medical Association, make up a group of five representative bodies. Each of these bodies appoints two of its members, these constituting a commission of ten. If a specialist in otolaryngology seeks membership in any one of the four societies, he submits an application to this commission. The commission holds examinations in different parts of the country at different periods. Would-be qualifiers for membership in these special societies are given an examination which is searching and thorough. The candidates are confronted with a number of clinical cases which they diagnose, and they are then examined as to methods of treatment and types of operation. If the candidate passes a satisfactory examination before this representative commission, he then becomes eligible to membership according to the rules of the different societies. A somewhat similar procedure is being tried out in the field of ophthalmology. It is beginning to be recognized that in making hospital appointments in these specialties one of the first points to be taken into consideration is whether the applicant has a certificate from the commission.

Cognizance should also be taken of the work that has been done on such a vast scale by the American College of Surgery. Hospital boards are beginning to demand that their surgical staffs should meet the requirements of the American College of Surgery. The American Roentgen-Ray Society, the Radiologic Society, the American College of Roentgenology and the Section on Radiology of the American Medical Association should appoint representatives which would constitute a commission which might carry on a similar work in roentgenology. In time it would be difficult for a roentgenologist who had not received the stamp of approval to obtain a position on the staff of a class A hospital. Such a step would do more to raise the standard of roentgen-ray diagnosis and therapy in this country than perhaps any other measure that could possibly be adopted.

### STANDARDIZATION OF ROENTGEN-RAY REPORTS

There is a wide diversity in roentgen-ray reports. Some are complete and filled with so much detail that they are rarely read in their entirety; others are so brief that they are of necessity incomplete. The clinician who reads the reports will always be more convinced of the value of the report if he knows that the reporter has seriously studied all phases of the problem. Now that chest examinations and gastro-intestinal examinations are becoming such an important part of the work of clinics and hospitals, the time seems ripe for suggesting that a standard blank be prepared similar in size and form to other hospital reports, so that it can be bound with the patient's chart. Such a blank permits a large part of the routine examination to be reported by checks of positive or negative on many of the routine details. A well planned blank with places for normal as well as abnormal observations will do much to convince the physician that the roentgenologist has covered all the important aspects of the case. Such a blank should, of course, have ample space for a description of such

features of the case as are not accurately described in the outlines of the blank.

Such blanks would save considerable time in the ordinary busy hospital. The difficulty of procuring competent medical stenographers is an additional argument in favor of these blanks. In chest reports I make use of a blank, on one side of which are recorded the preliminary fluoroscopic examination and on the opposite side the observations on the stereoscopic films. At the bottom is a vacant space to record, in a few words, the conclusions or additional notations. A similar blank is also used for the recording of the fluoroscopic examination of the gastro-intestinal tract; on the reverse side of the blank is the form for recording the film examination and the conclusions derived from them. I have found that many members of hospital staffs will not take the time to read elaborate descriptions of examinations; they are interested in obtaining the conclusions of the one who has made the examination. Such a blank provides the thoroughness of a complete report and yet preserves the opportunity to ascertain at a glance the opinion of the examiner.

Standard roentgen-ray blanks, prepared under the supervision of a commission of roentgenologists, could be provided by the National Hospital Association. Exceptionally, when the observations are atypical, the written description would be necessary. However, as in the larger clinics the number of roentgen-ray examinations which yield purely negative results is gradually becoming larger, the use of a standard blank in reporting chest examinations would be of great importance.

### STANDARDIZATION OF NOMENCLATURE

Another problem which confronts the radiologic profession is the multiplicity of words, many of which make interesting synonyms but are awkward and confusing. The cataloguers of medical libraries and the compilers of indexes of medical journals are becoming insistent that we clarify the situation by adopting a standard nomenclature. The unfortunate confusion that exists in the interpretation of the prefix "radio" is adding also to the perplexity. Why do we burden ourselves with such clumsy terms as roentgenogram, roentgenographer, roentgenoscope, radiogram and skiagram? How much more simple it would be if we employed the term "x-ray film" or "x-ray plate" as the case may be. We have brought on ourselves the odium of being classed as "the x-ray man" because we have coined such words as roentgenologist, radiologist and skiagrapher. I would suggest that words compounded from Roentgen be used for persons, as roentgenologist, while the term x-ray be used as descriptive for material or inanimate objects, as x-ray film and x-ray tube.

In writing roentgen-ray reports which do not come under the system of the report blank, a uniform nomenclature would be of great help. There should be definite terms to describe the different densities seen in the ordinary roentgenograms of both normal and pathologic bones. At the present time there exists a great confusion in the terms descriptive of calcium and soft tissue densities. It should be remembered that the more these terms conform to the basic facts of pathology, the more speedily will they be adopted and uniformity ensue. If we place our stamp of approval on indefinite terms or those which are clumsy, they will not be adopted and the confusion will continue.

The standardization of both biologic and electrical units of dosage in roentgen-ray therapy is an interesting problem but as yet not decisively settled. The ionization method is perhaps the most satisfactory but has many shortcomings. The ultimate decision of the International Congress of Radiology will be awaited with interest, since most properly it rests with that body to formulate a method which will be adopted for national and international use. It is a matter of congratulation that the American Bureau of Standards is now working on this problem and will offer the results of its investigations to the International Congress. When a standard unit is adopted, the editors of our roentgenologic journals should publish only articles on therapy which state the dosage employed in standardized units. If the present somewhat unsatisfactory situation seems deplorable, the present-day status should be compared with that of twenty years ago.

One of the teachings of the war was the importance of standardizing roentgen-ray equipment. It would seem rational to expect that a desirable uniformity be maintained in the roentgen-ray equipment of civil hospitals. A minimum standard has been stated, but the constant advance in technic and newer methods should make it imperative that these requirements be revised at least every two years.

### CONCLUSIONS

1. It is desirable that there be greater uniformity in teaching roentgenology to undergraduate students.

2. It is desirable that we as roentgenologists make a determined effort to require a higher standard of qualifications in those practicing this specialty.

3. It is desirable that a more uniform type of roentgen-ray reports be established in our clinics and hospitals.

4. It is desirable that a standard nomenclature be adopted for the purpose of clarifying the literature.

5. It is hoped that the members of this section will assist as far as it lies in their power in the work of the National Bureau of Standards, whenever called on to do so.

University Hospital.

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### ABSTRACT OF DISCUSSION

DR. WILLIS F. MANGES, Philadelphia: I wish that Dr. Hickey had recommended that this examining board might have the opportunity to examine those of us who have not yet been examined but who are members of some of the other societies. I do not think that our specialty has received the proper recognition in the medical school. At Dr. Hickey's school there is no complaint, but I doubt whether there is another medical school in the country where roentgenology receives anything like the same recognition as at his school. This means that the undergraduate, as a rule, is not given the opportunity to see how attractive a study roentgenology really is. Too often it has happened that those who have been encouraged to go into the work have done so because they follow the line of least resistance, or because they are attracted by the graphic methods we employ, or for some other reason. We do not have enough of the real scientifically minded young men. There are not enough roentgenologists in this country; we need more, but I hope that we can get good ones when we do get them, and I heartily approve of Dr. Hickey's recommendation that we have an examining board. I also approve of his idea of simplifying the terminology. I have recently written to the editor of one of our journals and given him a list of terms which I thought would be simple. I asked him to take up with the lexicographers the question of whether the terms would appear proper as words. If so, I would feel like recommending their adoption. The thought was that we keep Roentgen's original terminology; namely, "x-ray." I think that we can pay Roentgen no greater compliment than to call his discovery by the name he used. One of the terms I used was x-raygraph or x-raygram. I believe that the simplified terminology would be to our advantage.

DR. C. S. GORSLINE, Battle Creek, Mich.: The laity as a whole and the majority of the profession have been attracted to the roentgen ray and impressed more by the mechanical phenomena than by anything else. To the majority of practitioners a roentgen ray is a roentgen ray, but the men we want to impress are the discriminating diagnosticians, and I believe that the only way we can do this is to show them our works. In other words, the report of a real roentgen-ray diagnostician is not comparable to the ordinary report of the roentgen-ray laboratory or the man doing careless work. I do not think that one can do very much with the unthinking class, but I do think that we can do much to make our reports real scientific reports.

DR. P. M. HICKEY, Ann Arbor, Mich.: In the part of the paper which I omitted reading, I favored the establishing of a separate chair of roentgenology in every class A medical school, instead, as is done in many schools, of tacking the subject onto some other department or making it a subdepartment.

## ANORECTAL DISEASES

### PRESENT STATUS OF DIAGNOSIS AND TREATMENT *

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Although there has been a very marked increase of frequency and prominence in gastro-intestinal literature, anorectal diseases have not received the general consideration they merit. Many physicians do not display any hesitancy in frankly admitting that they are unfamiliar with these diseases, which are sufficiently numerous and various to demand specialization. This apparent indifference to or, rather, neglect of anorectal diseases by so large a percentage of physicians is not easy of solution, and I will not venture to offer any possible explanation. With the increasing attention that is being devoted to the medical aspect of surgical problems, it is somewhat encouraging to note that there is a perceptible increase in the number of physicians who are really interested in the subject of proctology. Recently it was stated that "the important rôle of anorectal diseases is only beginning to be accorded the serious attention so long claimed by the tonsils and teeth."

As a result of the well established theory of focal infection as a causative factor of disease, and the almost universally accepted dictum that successful therapy implies the location and eradication of all foci, it is only rational that the following interrogations be submitted for your consideration; namely:

If an apical abscess, why not a chronic anal fissure?

If an infected tonsil, why not an infected anal crypt?

If a sinus infection, why not a blind internal rectal fistula?

If a gallbladder, appendix or pelvic infection, why not any chronic anorectal infection?

If all possible existing foci are to be determined, the investigation and search must of necessity include a thorough anorectal examination. Such an examination is within the scope of every physician whose ambition is the performance of good work.

An ocular examination alone suffices for the diagnosis of some anorectal diseases. In every case, when possible, a digital examination is advised. Proctoscopy is the most valuable and accurate method for the diagnosis of diseases of the rectum. In the digital examination, when the protected and well lubricated finger is introduced into the rectum, some diseased areas are pushed upward and are seemingly higher than they really are. In such cases it is the careful palpation with the withdrawal of the finger that is of the greatest diagnostic value. Internal hemorrhoids, unless they are thrombosed or have become fibrosed as the result of some previous ulceration or ambulant method of treatment, cannot be diagnosed by digital examination. Uncomplicated internal hemorrhoids, which proctoscopy will demonstrate in a large percentage of adults, do not convey a special sensation to the examining finger. In the Indiana University Medical School Hospital it is my privilege, when not contraindicated, to make thorough anorectal examinations in every case, medical and surgical, that is admitted to the wards. These examinations have not infrequently diagnosed anorectal diseases of which no mention or complaint has been made, and in the majority of adult patients the presence of uncomplicated or quiescent internal hemorrhoids was demonstrated.

Of the numerous and various anoscopes and proctoscopes on the market, it suffices to say that the one employed should be susceptible of introduction into the rectum with as much ease and as little discomfort to the patient as is possible. To the physician who is really interested and desirous of more detailed information regarding the methods employed in anorectal examinations, I would recommend the special works on this subject by Hirschman, Lynch, Hill and the late Dr. Pennington.

Unfortunately, in the treatment of anorectal diseases, there are no standardized methods. Many of the methods of surgical therapy appear to be different in many respects. The principles involved, however, in the various methods employed are the same, and when the technic is correctly performed the results are similar and equally successful.

Medication that will cause irritating fluid stools should not be prescribed when any acute anorectal disease is diagnosed or even suspected. Complete rest of the diseased area is demanded, with the result that the rectal discomfort and pain will be much more quickly alleviated. Soap, glycerin, alum, turpentine or any other irritating agent in cleansing and evacuating enemas is contraindicated in the treatment of these diseases, as they tend to aggravate rather than relieve the symptoms. An enema of not more than a pint of cool water (from 60 to 70 F.), to which has been added one teaspoonful of either sodium chloride or sodium bicarbonate, will as a rule prove efficacious in securing the desired results. If such enema is retained it will not cause any irritation, and it may be repeated as frequently as is necessary for effective results. It is recommended in preference to the more commonly employed enemas whose rapid results are due to the direct irritation of the rectal mucosa. For many years, in the treatment of anorectal diseases both preoperative and postoperative, I have used either the soda or the salt enema. For the colon tube is substituted a number 8 soft rubber catheter which is attached to a small glass or metal funnel. The patient is requested to strain as at stool, and the well lubricated catheter is introduced easily into the rectal ampulla. This nonirritating enema, being introduced very slowly, makes possible the toleration and temporary retention of the entire pint of solution by the majority of patients. The results secured from this method of therapy in anorectal diseases have been highly satisfactory.

* Read before the Section on Gastro-Enterology and Proctology at the Seventy-Eighth Annual Session of the American Medical Association, Washington, D. C., May 19, 1927.

Suppository medication is employed either for the local effect of its ingredients or for the purpose of obtaining the systemic action of drugs after their absorption. As they are usually employed, the local action of suppositories is nil. They are pushed up into the ampulla of the rectum, where they remain until they are evacuated with the stool. In the larger percentage of cases they are only momentarily in contact with the diseased area, and it is my opinion that when suppository medication is so employed for the relief of anorectal diseases it has but little if any value. For the purpose of obtaining the systemic action of some drug in the relief of these diseases, this method of therapy is seldom indicated.

The diagnosis of cicatricial stricture of the rectum is easily made by digital and proctoscopic examinations. The surgical treatment of this disease has been very unsatisfactory. Interesting, indeed, is the carbon dioxide snow method of treatment reported by Clemons. The snow is collected in a chamois skin. It is then penciled and placed in a rubber finger cot, which is introduced through a proctoscope up to the rectal stenosis. Four such applications, at intervals of fifteen minutes, are made. It is a comparatively painless treatment and does not necessitate confinement of the patient. Clemons says:

> The offending structure is changed from a hard resisting to a soft yielding state. Edema is the result, as the application of the snow causes each cell of the fibrosed area to become distended and subsequently to liberate a serous exudate, after which the parts remain soft and boggy. This serous exudate makes its appearance in thirty-six hours, and gradually diminishes till it abates in four days.

A similar treatment is given after from seven to ten days. Kiger, in whose clinic this method of treatment was employed primarily, says that he has not operated on a cicatricial rectal stricture since it was inaugurated, and he regards it as the best treatment for that condition in which all other methods have proved unsatisfactory. In ten cases treated with the carbon dioxide snow method my results, for some undetermined reason, have not been so successful and brilliant as those reported by Clemons and Kiger. The early results were somewhat amazing and there was a very marked temporary improvement in all of the cases, but to date I have failed to effect a complete cure in any of them. An improvement of technic in future cases will in all probability secure results as successful as have been reported.

One symptom, itching, is sufficient for the diagnosis of pruritus ani. This disease has as yet no established pathologic basis and, as Mummery says, we are still very much in the dark as to the best method of treating it. We have no remedial agent that will effect a cure in every case. The hydrochloric acid treatment of Hanes and the alcohol treatment of Stone, both of which are needle injection methods, have proved of real value in many cases. They are not, however, to be accepted as a panacea for this disease. The failure to determine the etiology of this most troublesome ailment is sufficient explanation for the multitudinous therapeutic agents that have been recommended and employed for its relief and cure. In the cases of several months' or even years' duration, in which medical therapy has been a failure, the Ball operation or some modification of it is advised by some surgeons as the treatment of choice. In this operation all the sensory nerves to the pruritic area are divided. The result is an immediate relief of the itching. This method of treatment has received the endorsement of but few of the surgeons in this country. The nonacceptance of this operation by the majority of surgeons as the treatment of choice in the chronic cases of pruritus ani is best explained by some very disastrous results that have followed its employment.

Eusterman, in 1926, said: "In the light of modern medical progress, the traditional conception of gastric carcinoma is in need of revision. The familiar clinical picture of the disease is that of a frank and advanced stage." This statement is equally applicable to cancer of the rectum. Too much emphasis cannot be devoted to the fact that early rectal cancer presents few, if any, characteristic symptoms. Rectal uneasiness, discomfort, pain, constipation or diarrhea, and the discharge of mucus, pus or blood—any one of these symptoms, though they may appear trivial to the physician first consulted for their relief, demands a thorough local examination. The physician neglecting to make such an examination must accept the responsibility for failure to diagnose rectal cancer in its early stages. More satisfactory surgical results imply an early diagnosis of this disease. The majority of cases diagnosed and admitted to the hospitals are inoperable. When physicians give anorectal diseases equal consideration with that of other diseases, and do not regard their examinations of patients as being complete without at least a digital and a proctoscopic examination having been made, we can entertain hope that many will be the cases of cancer of the rectum suspected and diagnosed in their incipience.

Polyposis, or multiple adenomas, the so-called simple tumors of the rectum and colon, are diagnosed by a proctosigmoidoscopic examination. This disease causes considerable rectal irritation, and its chief symptoms are a somewhat persistent tenesmus and diarrhea, and the presence of much mucus and blood in the stools. It may occur as a true polyposis, and it may be found in association with a chronic ulcerative colitis, an old colonic stenosis, or a hyperplastic tuberculosis. A digital examination makes one suspicious. Proctosigmoidoscopy confirms this suspicion, and laboratory study of the tumors—which are easily removed with a snare—diagnoses correctly this disease. Successful surgical therapy is exceedingly difficult, the most satisfactory results being secured in the cases in which the polyposis involves the rectum alone, or a limited area of the colon. I have under observation a lad, aged 15 years, in whom this rather rare disease involves the rectum and entire colon. Radical surgery in this case is impossible. Associated with the polyposis is a chronic ulcerative colitis. Enemas consisting of 750 cc. of a 1:3,000 aqueous solution of neutral acriflavine, as recommended by Crohn and Rosenberg in the treatment of chronic ulcerative colitis, were given twice a day, and when possible retained for twenty minutes. This treatment proved successful in controlling the diarrhea, tenesmus and bleeding, but repeated proctosigmoidoscopic examinations did not demonstrate an appreciable effect on the number and size of the adenomas.

Chronic ulcerative colitis, with its prominent symptoms of obstinate bloody diarrhea, fever and general weakness, is diagnosed by proctosigmoidoscopic examination. Its medical and surgical treatment have proved unsatisfactory in the majority of cases. Bargen's discovery of a gram-positive, lancet-shaped, diplococcus as the specific causative factor of this disease is to be regarded as a brilliant achievement. In association with Buie, cultures in which this micro-organism was first

identified were obtained from the base of the ulcer. A specific vaccine therapy for chronic ulcerative colitis has been inaugurated by Bargen in the Mayo Clinic, and the results reported are most encouraging. He states that in addition to the vaccine treatment it is very essential that all foci be removed. Special diet and supportive measures are prescribed, and the cure of the secondary ulcerations is effected by topical applications through the sigmoidoscope.

The time allotted will not permit of a discussion of all anorectal diseases. A brief mention, however, should be given to the palliative or ambulant treatment of internal hemorrhoids. As previously stated, a proctoscopic examination will demonstrate the presence of internal hemorrhoids in many, if not all, adults. In the majority of cases, excepting for a slight uneasiness or discomfort following stool, they are practically symptomless. It is only when local symptoms, such as pain, bleeding and prolapse, are present that the physician is consulted for their relief. In not a small percentage of these cases the regulation of diet and stool, together with topical applications, will effect a rapid subsidence or disappearance of all local symptoms. These patients are of the opinion that they have been cured. However, their internal hemorrhoids, in a quiescent and symptomless state, can be demonstrated by a proctoscopic examination. If this simple therapy proves unsuccessful, electrotherapy and the phenol (carbolic acid) or quinine and urea injection methods are considered by some surgeons and many physicians as the treatment of choice.

Many of the surgeons engaged in this field of work are of the opinion that similar results are secured by all these ambulant methods of treatment; namely, formation of a thrombus and resulting fibrous tissue which contracts and reduces the size of the internal hemorrhoid. Some patients so treated are relieved symptomatically for several years, and a few are so fortunate as not to require further treatment. The statement may be challenged somewhat vigorously, but it is my personal experience that a proctoscopic examination in the majority of cases treated by these ambulant methods will demonstrate the presence of the internal hemorrhoids changed to a slight extent in character and general appearance. It is only with the employment of this ambulant therapy to the degree or extent whereby necrosis or sloughing results that the complicated varicosities or internal hemorrhoids can be eradicated. This very naturally would prove a dangerous method of treatment. Terrell, the originator of the quinine and urea method of treatment, says: "After using it for twelve years I am convinced that it is a safe, efficient and reliable agent in the treatment of simple uncomplicated internal hemorrhoids." He further says: "Satisfactory results will be secured only when the surgeon is able to select cases suitable to its use." A personal experience with the Terrell method has not been so satisfactory, but I continue to employ it in selective cases, more as a palliative than as a curative procedure. It is as efficient as the phenol treatment, and is regarded as a much safer method for internal hemorrhoids. All the various ambulant methods of treating internal hemorrhoids should be employed only in selected cases and when radical surgery is refused or contraindicated. In a large number of cases they may relieve the symptoms, but they are unsuccessful in effecting a complete cure of the disease. By the term "complete cure" is meant the eradication or removal of the internal hemorrhoids.

## CONCLUSION

I would urge physicians to become interested in the diagnosis and treatment of anorectal diseases. They should give these diseases equal consideration with those of the tonsils, teeth, gallbladder, appendix, stomach—in fact, all diseases. If not already his practice, a physician should make anorectal examinations in every case in which local symptoms are present and a diagnosis has not been established. By so doing he will be satisfied with the results secured, and it will not and cannot be said of him that a diagnosis of hemorrhoids was made with a rectal carcinoma only a few inches away. The importance of an early diagnosis of cancer, no matter what its location, does not need comment.

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## ABSTRACT OF DISCUSSION

DR. FRANK C. YEOMANS, New York: Dr. Graham's paper is very timely. The failure to diagnose cancer of the rectum early is due to three main causes: (1) the indefinite incipient symptoms inherent in the disease; (2) failure on the part of the patient to seek medical advice until it is too late, and (3) failure on the part of the physician, when consulted, to recognize the condition. The vigorous campaign for periodic health examination and the excellent work of the Society for the Control of Cancer are educating the laity more and more to apply for periodic examination.

DR. E. G. MARTIN, Detroit: Proctology is an important subject, and its discussion is of paramount interest because its teaching is inefficiently conducted in most medical schools. Approximately 95 per cent of anorectal disease is located within 1½ inches of the anocutaneous margin. It is therefore not an unusual error to cover with an improperly selected instrument most of the pathologic conditions of the anus during examination. A proctoscope permits a view of the rectum but not of the anal canal. An anoscope should disclose at least one third of the anal canal at a time; there are several of this type that are satisfactory. One of the simplest instruments for exposing the anal canal to view is a modified Sims speculum, called an anal retractor. The index finger should fit this speculum as an obturator, and it should be removed after introduction; when the patient is asked to strain or bear down half the anal circumference comes into view, permitting the use of a crypt hook in a search for focal infection, as well as the easy exhibition of internal hemorrhoids. Hemorrhoids must be seen for diagnosis, since they cannot be felt. Free lubrication in all anorectal examinations is absolutely necessary.

DR. JOHN A. LICHTY, Clifton Springs, N. Y.: It is well that the proctologists are here and are telling the internists the necessity of making a proper rectal examination. There are all sorts of rectal examinations. The simplest and probably the most satisfactory is the digital examination; but even the digital examination can be done in such a way that it does not furnish the necessary and available information. Usually the finger, especially if it is large, is inserted without being sufficiently lubricated. The traumatism established in this way, and also, of course, by instrumentation and so-called thorough colonic flushings, may do harm. I have seen patients die of pulmonary embolism soon after rectal examination for prolonged irrigation of the bowels. At the autopsy, which revealed this condition, many small thrombi were found in the hemorrhoidal veins. It is a very easy matter to use warm oil or petrolatum on the fingers, or even to inject warm oil through the anus before making the examination. It is always well to have the complete cooperation of the patient.

DR. ARTHUR A. LANDSMAN, New York: Dr. Graham's paper covered such a wide range of pathologic subjects that it would be impossible to attempt to discuss all of them at this time, so I shall confine myself merely to his suggestion for the treatment of internal hemorrhoids by the injection method. I have seen this method used at the St. Mark's Hospital in

London, in quite a number of cases by men who have had a lot of experience with it, and if it is going to be used as a palliative measure for the relief of bleeding, I approve of it. But it must be understood that the injection of phenol (carbolic acid) solution is in no sense curative. These patients invariably return with a recurrence in a few months. It is also open to the objection that its effect cannot be limited, and it is liable to lead to sloughing of the rectum, as in a case which I observed in which the lower 4 inches of the bowel was destroyed.

DR. E. H. TERRELL, Richmond, Va.: I have used quinine and urea injections, usually in a 5 per cent solution, in the treatment of 4,000 or 5,000 cases of hemorrhoids, and have not had any serious consequences in a single case. In using the injection treatment, the most important consideration is the selection of cases. Any one who says that he can treat all cases of hemorrhoids by the injection method, and get results, is not telling the truth. Only about 50 per cent of the cases of hemorrhoids should be or can be treated satisfactorily by the injection method. Suitable cases for this mode of treatment are of the simple internal variety only. Internal hemorrhoids that bleed at stool, or protrude, when not inflamed can be treated satisfactorily by the quinine and urea method, and an absolute cure can be brought about. Frequently, these patients are only symptomatically cured, as was said a moment ago, because insufficient treatment is given. My practice is to continue these treatments until all signs of hemorrhoids are obliterated. If this is done, complete and permanent cures will be obtained.

## PHYSICAL THERAPY AND ITS RELATIONSHIP TO ORTHOPEDIC SURGERY *

ALBERT H. FREIBERG, M.D
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In the early part of the nineteenth century, largely through the work of the Swede Ling, gymnastic methods derived a great and well deserved popularity in the treatment of postural deformities. Concerned most largely with the treatment of scoliosis, the vogue of gymnastic methods has been deservedly maintained up to the present, even though a sovereign value is no longer attributed to them. At the same time, it had to be recognized that this tribute must be paid to the musculature of the trunk and that all the forms of retentive and corrective appliances formerly in use were, in the end, of little practical value unless both the wasting effects of inactivity and the supportive function of the musculature were taken into account.

The result of the widespread use of gymnastic methods in combating postural shortcomings was to bring about a great interest in them on the part of those who were primarily concerned with "normal" or "educational" gymnastics and those which were intended as a physical complement to the education of the young. There developed, in consequence, what was known as "corrective gymnastics" and in various countries this became a part of the regular curriculum of normal schools of gymnastics. The usefulness of massage, together with the associated active and passive movements which were formerly spoken of as Swedish movements was soon shown; as is often the case, their value was greatly overestimated for quite a time and they were often employed in a manner quite inappropriate, unintelligent and, therefore, futile. Largely through Zander, mechanical appliances were contrived to take the place of the hand and to supplant the trained masseur. It is only fair to say that the medical profession as a whole never has learned to distinguish between massage and rubbing. Massage and corrective gymnastics require an especially trained personnel and the opportunity of devoting sufficient time to the individual patient, and only in rare instances was it possible for the surgeon to be in position to direct the work of such trained persons intelligently.

The advent of such resources as hot air baths, electric heating methods and the therapeutic use of light has served to divert attention from the usefulness of these older means of treatment; this is but another manifestation of the era of mechanical development and its associated practices of commercial exploitation in which we live. From the modest equipment of an electric battery which comprised the galvanic and faradic currents and which was the possession of the progressive practitioner of a former generation, we have come to the possession of elaborate and imposing outfits for generating electric currents of different kinds, using high frequency electrodes, many of which are of doubtful value and many of none at all, except it be "psychic." Lights and heats of various kinds are found in abundance, and a visit to a richly equipped office may well make one wonder at the versatility of its owner, who, despite the great demand on his time made by the exigencies of practice, has been able to devote himself to the mastery of these complicated machines and their application to the patient.

The solution may be found in the courses of instruction which are being offered to the profession; offered not, indeed, as a part of the educational schemes of our graduate schools. They are offered by concerns who manufacture apparatus and, most often, very good apparatus. The circulars announcing them as courses in physical therapy disclose that they are given in salesrooms or places immediately contiguous. They are conducted often by colleagues of ours who have training, experience and reputation. An examination of the prospectus may show, however, that the teaching is almost if not entirely concerned with the use of apparatus and chiefly electric apparatus. Still more remarkable is the fact that the apparatus is mostly good and useful under proper conditions. The most of us have such apparatus as part of our own equipment, in one form or other. I have before me a dignified looking volume entitled "Physical Therapy" and written by a man of professional standing. Examination shows it to consist mainly of description of electric apparatus and its use. The virtues ascribed to these methods are very great indeed; but they are even more manifold than great and they are sometimes even incompatible the one with the other and according to the instruction furnished by the author.

The purpose of what I have said is surely not to decry the use of modern methods and apparatus. It is rather to call attention to a proper definition of physical therapy and to the fact that the real meaning of it is being misconceived in a way that is detrimental and unfortunate. Not that I shall be foolish enough to offer a definition in precise terms but rather to insist that physical therapy and apparatotherapy are not synonymous; rather point out that some of the desiderata of great importance to us as orthopedic surgeons are in danger of underemphasis and that certain phases concerned with the development of this important help in treatment may be discussed by us with profit. Per-

* Read before the Section on Orthopedic Surgery at the Seventy-Eighth Annual Session of the American Medical Association, Washington, D. C., May 20, 1927.

haps I need not say that with the acceptance of new methods of applying and using heat and light and electricity there has not come the need for sloughing off anything which we had before which was good; that we should really not be so much concerned with the possession of these new things as with knowing how and when to use them. Diathermy, speaking of it not in its destructive forms, is after all simply a more useful and convenient method of applying heat and of localizing its action with greater accuracy; it is not known to have any specific action of its own beyond that inherent in the production of heat in the tissues. It is altogether likely that it helps us by its creating the need for hyperemia in the tissues just as is the case with the more superficial methods of doing this which we have been using hitherto.

There is no thought in my mind that the practice of physical therapy must become the function of the physician or surgeon himself. For the most part he will always lack the practical training, the experience and the constant practice that are necessary unless, perchance, he has chosen to devote himself to this field as his major activity. Needless to say, such a course need not prove unworthy of persons of high endowment, and such are to be found in the personnel of our profession, even though in very small number. Every physician should, however, possess a thorough understanding of the theories on which the use of physical therapy, in its various branches, is based. He should have definite knowledge of the technic. Otherwise the physician will be found in the position of one who would prescribe drugs without having been grounded in pharmacology. The proposal to add to the burden of the medical student in the least degree may not be made lightly. At the same time, we may not condone the use of any methods of treatment by a modern physician without intelligence and reasonable training.

I assume that the proposal to reject from practice the use of physical therapeutic methods would be regarded as absurd at the present time. This is particularly the case among orthopedic surgeons, practically all of whom may be trusted to regard corrective gymnastics, postural training, the application of heat and light in various forms, massage and therapeutic movements as well nigh indispensable to them. I have often wondered, however, how many who prescribe these things for their patients could, offhand, give an acceptable definition of massage and what it may be expected to accomplish; how many could make clear what is the difference between massage and rubbing. How many, having installed diathermy apparatus or the many forms of therapeutic lamps, have a clear idea of the nature of what emanates from them and what is the effect on the tissues of the body or on the body as a whole? How many of us are familiar with the physiology of exercise and how many can, with real understanding, lay down the indications for active or passive movements? Are we to learn these things by rule of thumb or simply by the experience of having some one treat our patients for us who knows more about it than we do, but who is supposed to work, nevertheless, in a capacity subordinate to ours? I have the feeling that it will be granted generally that even though not to be regarded as indispensable, physical therapy in its broad sense is distinctly worth while; that both among physicians and surgeons, even though to varying degrees, it is looked on as a valuable help and, very often, as the most valuable aid in the given situation.

There are, however, certain other implications in this general subject concerning which we should be frank with ourselves. Many of our colleagues possess neither the training nor the opportunity of enabling them to practice these methods themselves, nor do there exist in their communities persons to whom this may be entrusted by virtue of their training. Shall it be admitted that the various cults and pathies supply the deficiency and that patients shall be referred to them for the treatment we cannot offer? I should without hesitation say yes, were it true; but it is not true. I have also been able to satisfy myself that what they have to offer is not an acceptable substitute, either. They do not have the preliminary and fundamental training to fit themselves for this work, but it is no mistake to say that some are now getting it and more will be doing so. At the present time, not only are there none of these cults that are an acceptable substitute for proper physical therapy, but none of them claim to be.

I believe that there are few orthopedic surgeons who will say that, with these words, missiles are being directed at a man of straw. It would seem incontestable that orthopedic surgeons should, by reason of their own training and experience, be the first to make certain acknowledgments as the first step toward clarification of this situation. I will be so bold as to state certain of them:

1. Physical therapy is not identical with apparatotherapy.

2. Some of the most important methods implicit in the term physiotherapy cannot be supplanted by the use of any apparatus now existing.

3. Courses of instruction given in mercantile establishments whose underlying purpose is the popularization and sale of certain forms of apparatus are not to be regarded as acceptable substitutes for training in medical schools or hospitals, either for the physician who is to direct the treatment or for those who are to act under his direction.

4. None of the so-called drugless cults are to be regarded as identical with physical therapy or as a substitute for it.

5. It is important that the principles of physical therapy, in its modern sense, should be a part of the education of the student of medicine; he should also be given a minimum amount of practical training in its application.

6. A more numerous personnel, thoroughly trained in the practical application of physical therapy in its various branches, should be at the disposal of the medical profession.

7. The use of apparatus, while extremely valuable, has been overemphasized, as regards both its value and its indispensability.

There remains to be discussed how a personnel shall be supplied to perform the practical part of this work and from what source it shall be derived. If, instead of consisting merely of a rather haphazard use of certain apparatus, physical therapy is to embrace corrective gymnastics and massage; if it is to be given by those who have been trained to understand as well as to employ active and passive movements of the joints, it may not be allowed to rest on such slender basis as is implied in a course of six, or even eight, weeks' duration. Less so still, if these are imparted to persons who have no previous training in the anatomy and physiology

of the body, or, having these, who have no training in the management of the body which has become abnormal through disease or injury. It seems to me not less necessary that one who is to be entrusted with the practical application of physical therapeutic measures should be ordinarily grounded in the elements of anatomy, physiology and the human reactions to abnormal processes than one who is to take care of bed patients who are ill. What is it that justifies our being satisfied with one who has had but little more than training in a gymnastic normal school, instead of a nurse's training, when we entrust to her a case of arthritis or poliomyelitis? Is her need of knowledge in anatomy or the nature of inflammation, or what happens when adhesions are torn asunder, less or more important than it is in the nurse? It seems to me that not only is the nurse the one who is most appropriately to be applied to this work, but it constitutes as inviting a field for graduate specialization for her as for any of the others to which she is being attracted. I have no idea, however, that even though she is a nurse she may be trained for this work in the space of a few weeks.

## CONCLUSION

I wish to repeat my conviction that the physician requires to be taught, as a part of his undergraduate instruction, the elementary principles of physical therapy and something of their application. Even in this advanced age, our students are taught the pharmacology and therapeutics of many drugs which have become practically obsolete. Why should they not be taught more of the methods by which much use of drugs has been supplanted? How can the physician and surgeon otherwise order and supervise their application with intelligence? Here, to my mind, lies the task of the orthopedic surgeon in preserving and augmenting what is a precious heritage.

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## ABSTRACT OF DISCUSSION

DR. J. W. SEVER, Boston: Physical therapy is intended to supplement the work of the surgeon, the medical man or the orthopedic surgeon. With the various mechanical developments that have come in the last few years, it has tended to degenerate into a sort of mechanical medicine instead of becoming true physical therapy. That has been entirely because of the fact that the apparatus manufacturers have been pushing their apparatus. The interesting part of it after all is that men who are well trained, who are intelligent, and who have ample opportunities to check their own work are willing and ready and do turn all of their physical therapeutic work over to anybody who happens to come into their office. They do not know whether the individual is trained in anatomy or in physiology; they do not know anything about muscle reeducation or muscle function, which is absolutely essential to the intelligent treatment of any case, and they are willing to accept any person who says that she is a masseuse and can undertake the work. On the other hand, even in New England there are many men who are older in the profession than I, who are not orthopedists, to be sure, but who are general practitioners, who will turn their cases over to an osteopath or a chiropractor simply because a trained physical therapeutist is not present to whom they can turn over their cases. That situation should not exist. It exists not only with the general practitioner but, to my own knowledge, with the reconstruction clinics of insurance companies. I know of one which turns all of these cases over to an osteopath. The important point that Dr. Freiberg emphasizes in his paper is that the medical student when he graduates from medical school and then the hospital, as a rule, has not had any training on special clinics in physical therapy; he knows nothing about it, except that he knows that there is such a thing. There is no branch in the medical school or no course in the medical school where such instruction is given, and it seems to me that the rise of the cults in this country has been very great, as we found out in Massachusetts a number of years ago when Dr. Frothingham and Dr. Patch and I were on a special committee to investigate the osteopaths and chiropractors in Massachusetts. We found that if there was any therapeutic agent that was good, it should be in the hands of the medical schools and not in the hands of the cults; that the medical schools had not taken physical therapy up, and that the students were not instructed as they should be. As Dr. Freiberg stated, it is much more important than drugs.

DR. H. W. ORR, Lincoln, Neb.: There are times when any of us may be in doubt as to how much benefit the patient is deriving from any particular physical therapeutic method, or how much of his improvement may be due to the physical therapeutic regimen. It is a fact that the patient under physical therapy does better than the patient who is not so treated. It is important for us to be able to distinguish between the benefits that arise from superior technic in the hands of the physical therapeutic operator and those which arise in spite of the fact that the operator does not have any real familiarity with methods or with apparatus. In the reconstruction aids we have a class of assistants who are familiar with the underlying principles of this work and who become familiar with the technic that is to be employed; they know their apparatus and they get results, and they have an educational effect not only on the patient and the patient's friends but also on the physicians as well. Many physicians who employ elaborate apparatus are quite unfamiliar with the principles that must underlie the treatment of these cases. I have had reconstruction aids on many occasions come to me, requesting that the referring physician in such and such a case have it suggested to him that it is of no use to apply physical therapy or physical therapeutic methods to an extremity that is in fixed deformity. One would think that this would be obvious, but the fact of the matter is that in almost every large clinic of this sort we see patients having diathermy applied or massage, or some treatment of this sort, for whom the necessary correction of deformity has not been done. It should become general knowledge that the application of physical therapy and the application of braces must be preceded by such surgical or manipulative treatment as will put the parts in correct position for function if function can be obtained. The patient under physical therapy must be supervised in such a way that correct surgical principles are being observed not only at the time of primary operation but all the way through.

DR. D. P. WILLARD, Philadelphia: The control of physical therapy by the orthopedist is a most important matter. At the present time, physical therapy is not controlled by the orthopedist as it should be. Lately there have been two trends among the medical profession. One has been to fill offices with sensational apparatus, most of which has more effect on the mind than on the body. The second trend has been to throw the whole responsibility of physical therapy onto some person who is more or less—usually less—trained in the work. I do not believe that there is any section of the profession that needs physical therapeutists as much as the orthopedist does. Of course, the medical man and the surgeon do need them to a certain extent; the neurologist needs them, but our work, especially our postoperative work, can be ruined if the after-care is done inadequately. In Philadelphia we have for years had schools of physical therapy. They have been under the charge of very competent people in the Orthopedic Hospital and the Post Graduate School of Medicine. We are constantly trying to make the course more thorough. We want to try, if we can, to make it a two year course. We are giving now, and hope to give even more thoroughly, a basic training in anatomy, a certain amount of training in pathology, a course in didactic lectures from the various surgeons on the different conditions that physical therapy can help, and thorough training in massage, in the various types of exercise and in the essentials of the application of electricity. We are training those students, as far as we can, to be experts in the use of these various

methods, and we are also training them to depend absolutely on the medical profession to tell them what to do; the actual technic of the doing is left to them, but the prescription writing is left entirely to the medical profession. These physical therapeutists have formed an association. They have members of the medical profession talk to them about orthopedics, neurology and medicine in relation to physical therapy. They are endeavoring to educate themselves in the newer methods as fast as we can teach them, and they are trying to establish the closest type of liaison between the profession and themselves. Unquestionably, the beginnings of the knowledge of physical therapy should be in the undergraduate schools. It is probably more important for the undergraduate to know the basic principles of physical therapy than it is for him to know the application of plaster casts, and certainly the various forms of more advanced operative technic. If training can start there and be carried on to a greater extent in postgraduate work, then, I believe, physical therapy will advance the way it should. If we allow physical therapy to go into the hands of the various "ists" and "isms" that are springing up so fast at present, I am certain that physical therapy is going to fall into disrepute.

DR. H. D. CORBUSIER, Plainfield, N. J.: Physical therapy is not alone electrotherapy, although the tendency nowadays has been to lean more toward electrotherapy. The large number of men who are interested in electricity, and the large number of firms that are manufacturing electric apparatus and advertising it so widely, have led the medical profession, in general, to consider the whole situation from the electrical standpoint. There is no doubt whatever that electrotherapy is a very valuable asset, not only for the orthopedic surgeon but for general medicine also. The manufacturers are sending lecturers to members of the American Medical Association, who give instruction for one week and then intimate that in that period the general practitioner has been able to learn so much that he can become an electrotherapeutist. That, to my mind, is extremely bad, but it is countenanced by the American Electrotherapeutic Association, and that organization includes on their program men who are very much interested in the manufacturing and sale of apparatus. It seems to me that this combination is not very wise. These same manufacturers advertise courses of instruction to physical therapy technicians, or aids. If one sends one's office girl to them for that instruction, in two or three weeks she will be a competent assistant, able to administer the treatments. Of course, this is all nonsense, and not only that, it is harmful. The orthopedists should do what they can to suppress this commercialism, because it gives physical therapy a very bad name among persons who do not take the time to find out what physical therapy really means. One point is extremely important; namely, that remedial exercises should be considered as being just as essential as anything else. They are certainly as important as proper massage. Many persons call themselves masseuses who have had absolutely no training in that line of work. There is no college so far that gives any course in physical therapy to medical students, or even intimates that there is such a thing as physical therapy. The training of the physical therapeutists as assistants is a point in which the orthopedic surgeon should be interested. There are those among the profession who are doing nothing but electrotherapy or physical therapy who feel that we should not call any one a physical therapeutist who is not an M.D. I notice that among the orthopedic surgeons a physical therapeutist is referred to as one who administers physical therapy, whether he or she is an M.D. or not. As to the training of the physical therapy technician, the groundwork of nearly all those whom we employed in the army was a thorough training in a school of physical education. These schools give thorough grounding in anatomy and kinesiology, which is of the utmost importance, and more than is given in nurses' training schools.

DR. RICHARD KOVACS, New York: Courses in physical therapy are now being given under the auspices of the proper authorities. Columbia University gives two postgraduate courses for physicians, one course of training for nurses and one course of training in traumatic surgery and physical therapy. Physical therapy is also taught at the Polyclinic Medical School and Hospital of New York. The New York Electrotherapeutic Society, as well as the American Electrotherapeutic Association, has always considered it against the dignity of the members to take part in any course or program given under commercial auspices. As to the statement of Dr. Corbusier, I was mainly responsible for the program to which he referred, and I would like to be told who the men are who are charged with being closely identified with a manufacturing concern. We try to do our own housecleaning, and we are cooperating with the Council on Physical Therapy of the American Medical Association, which is a body similar to the Council on Pharmacy and Chemistry. I am confident that in a few years we shall bring about a perfectly satisfactory state of affairs. The time-worn expression of the psychic influence of high frequency electrodes makes me wonder whether, if Dr. Freiberg were to get burned by one of those high frequency electrodes, he would know whether it was his mind that got burned or something else. In applying physical therapy we want biologic reactions, and we want to put physical therapy on such a basis that we can clearly understand the reactions produced by various physical agents. It so happens that electrotherapeutic apparatus is more easily applied in a physician's office than the other more cumbersome methods of physical therapy. However, we are using all the methods in conjunction with well equipped hospitals. Physical therapy goes into every department of medicine—surgery, nose and throat, gynecology, neurology—and will not be advanced properly unless those who are to judge when and how to apply these methods are fully trained physicians.

DR. ROLAND HAMMOND, Providence, R. I.: Ever since I began to practice orthopedic surgery I have used physical therapy in some form or other, but from the very beginning I appreciated the fact that my patients must be under my own control, and I have never, until physical therapeutic departments were established in hospitals, referred them to any other department or to any other person for treatment except under my own supervision, for the reason that the orthopedic knowledge comes first and that the physical therapy is a long way behind as a second. Many patients coming from a distance see no reason why they should not receive physical therapy at home. I tell them that it is not the instrument but it is the orthopedic surgeon behind the instrument that is the important thing. Also, I am sorry to say that in some of the best physical therapeutic clinics in the country that I have seen conditions are being treated by physical therapy which demand orthopedic treatment first but which are not receiving it.

DR. ALBERT H. FREIBERG, Cincinnati: A graduate course for training physicians is not in the same way effective or in the same degree effective as would be a course of training for undergraduates. If physical therapy is an acceptable aid today, I see no reason why the student of medicine should not have at least a fair grounding in the principles of physical therapy, as much as in any other method of treatment which is required for the human body. As to the remarks of Dr. Kovacs concerning psychic influence, I think that he would agree that the vacuum electrodes that one can buy in every corner drugstore, which give a beautiful purple or violet light, do not have any real action beyond that of psychic influence. The vacuum electrode which happens to be operated by a larger apparatus in a physician's office has no more effect on the condition; but I am quite confident that it can be used to the detriment of the patient and that it can have a real influence for good as well as for bad. I would not be misunderstood in stating that there is no virtue in high frequency currents. There is no question of that. So far as the question as to who shall be a physical therapeutist is concerned, I am not narrow in my views on that subject either, nor would I exclude the well trained gymnast or graduate of a school of education in gymnastics who afterward wishes to apply himself to this particular field and is properly trained. Best of all would be the cooperation of a well trained physician who applies himself to this particular field and who works in close cooperation with some one who knows how to direct him and cooperate with him; but it seems to me that if physical therapy is to become a widespread method of application to patients generally, we must have a large personnel, and we are most likely to get such a personnel properly trained if we encourage the nurses to apply themselves to such training.

# THE NONCALCULOUS GALLBLADDER *

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In the fall of 1925 [1] ascertained the end-results of a small series of gallbladder operations and found that 84.4 per cent of the stone cases were apparently cured, whereas only 70 per cent of the noncalculous group were without symptoms. About the same time Whipple [2] found in a similar study that 89.4 per cent of the calculous cases and 76.6 per cent of the noncalculous cases were cured by cholecystectomy. The difference in the percentage of cure was almost identical in the two series.

The liability of frequent recurrence of symptoms after operation on the noncalculous gallbladder has been long known, and in an early paper Stanton [3] found only 46 per cent of cures in a series of ninety-nine cases, in ninety-two of which cholecystostomy had been performed. But in 1914, W. J. Mayo [4] noted that simple drainage will not cure the majority of these cases, whereas cholecystectomy will relieve the patient. Cholecystectomy is now the rule, but our results are not perfect. In 1925 Judd [5] reported that from 64 to 70 per cent of a group of noncalculous cases were cured by operation, whereas from 81 to 87 per cent of the group with stones were cured. There are many other observations of like nature in the literature, but the most interesting is the recent one by Olch [6] from Graham's clinic, in which the end-result of cholecystectomy in a series of sixty cases of noncalculous cholecystitis was 100 per cent cured.

The existence of chronic cholecystitis without stones has been recognized for many years; Mayo Robson, for instance, gave a perfectly clear description in his book published in 1897. In 1909 Moynihan [7] called attention to the condition later termed the "strawberry gallbladder" by MacCarty and Corkery.[8] The symptoms of chronic cholecystitis without stones vary from the calculous group only in degree and in the usual absence of severe colic. That colic does occur is well known, and Smithies [9] noted this symptom in 54.5 per cent of 434 nonstone cases. Abrupt cessation of pain is significant of stone. The pain radiates to the shoulder; there is tenderness over the gallbladder and distention of this organ may be detected, all just as in the stone cases. In a large group these definite symptoms may be replaced by such indefinite evidence as fulness in the epigastrium, belching of gas and nausea.

It is not possible, therefore, to differentiate clearly from the symptoms whether or not gallstones are present in a suspected case of chronic cholecystitis. Diagnosis is relatively easy when the symptoms are well marked and particularly when colic has occurred, but surgeons have constantly urged that the diagnosis be made on the "threshold symptoms," and this the man in practice can rarely do. If stones are considered as accidental phenomena in the course of cholecystitis, exposing the patient only to the danger of duct obstruction and possibly carcinoma, the conclusion is reached that the disease of the mucosa and gallbladder wall is the essential pathologic condition, because the modern point of view teaches that if the gallbladder cannot concentrate the bile brought in through the cystic duct and cannot empty the concentrated bile when demanded by digestion, there is sufficient interference with what might be called the rhythm of digestion to cause the symptoms termed indigestion.

Attacks of acute infection in the gallbladder may produce adhesions; the gallbladder walls may become greatly thickened and scarred; the organ may be rather free in its attachments, and kinks may occur when it is distended or if the liver falls forward in ptosis. Such conditions may cause attacks of severe colic or remote phenomena, such as arthritis or myocardial change associated with the gallbladder symptoms, which would make the diagnosis apparent even to the most casual.

Correct diagnosis is the first essential, and if physicians and surgeons have found it difficult to separate the gallbladder lesion from duodenal ulcer or from chronic appendicitis, it is natural that so-called laboratory methods of diagnosis have come into vogue. Gastric analysis is important only if a high acidity and hyperchlorhydria are present, in which case duodenal ulcer is more probable. Gastro-intestinal studies with the roentgen ray furnish exact information regarding ulcer and significant information as to appendicitis, provided the roentgenologist is an expert. The roentgen-ray diagnosis of gallstones is too often misleading to make it a reliable test, particularly if the evidence is negative, and frequently in typical cases I have had difficulty in convincing a patient of the necessity of operation because the results of a roentgen-ray examination have been negative. Of course, if there is positive evidence of stones, of adhesions or of thickening, the examination is worth while. But today we are not often confused in cases in which there are advanced pathologic changes, but are more concerned with the diagnosis of those presenting moderately severe symptoms, the expression of disturbed function.

In such cases, the discovery by Graham of the shadow-producing properties of certain dyes has made an enormous difference, and it is possible to measure the concentrating power of the gallbladder and its rate of emptying as well as to determine the patency of the cystic duct.

In 1919, Lyon [10] conceived the idea of duodenobiliary drainage after stimulation of the duodenum with magnesium sulphate and other solutions, and in a succession of contributions he has built up an elaborate method of diagnosis which has given rise to almost endless controversy. Whatever may be the final decision as to the value of the method, he deserves high praise for the stimulation of gallbladder research by the interest aroused in the profession.

Lyon's application of Meltzer's theory and Graham's cholecystography depend on the ability of the gallbladder to empty itself, and considerable speculation has arisen as to whether or not this is possible. Graham [11] apparently believes that the discharge of bile into the duodenum takes place during the relaxation phase of a duodenal peristaltic movement, and thinks that the work of Copher and Kodama leaves little rational basis for the conception of Meltzer. He believes that the chief func-

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1. Muller, G. P.: M. J. & Record **123**: 446 (April 7) 1926.
2. Whipple: Am. J. Surg. **40**: 129, 1926.
3. Stanton, E. M.: End-Results in Gallbladder Surgery, J. A. M. A. **57**: 441 (Aug. 5) 1911.
4. Mayo, W. J.: Am. J. M. Sc. **147**: 469, 1914.
5. Judd, E. S.: Collected Papers of the Mayo Clinic, **17**: 152, 1925.
6. Olch, T. Y.: Am. J. M. Sc. **173**: 368 (March) 1927.
7. Moynihan: Ann. Surg. **50**: 1265, 1909.
8. MacCarty, W. C., and Corkery, J. R.: Am. J. M. Sc. **159**: 646 (May) 1920.
9. Smithies, Frank: Gallbladder Adhesions, J. A. M. A. **71**: 1804 (Nov. 30) 1918.
10. Lyon, B. B. V.: Diagnosis and Treatment of Diseases of the Gallbladder and Biliary Ducts, J. A. M. A. **73**: 980 (Sept. 27) 1919.
11. Graham, E. A.: Am. J. M. Sc. **172**: 625 (Nov.) 1926.

tion of the gallbladder is to maintain tonus and to prevent overdistention. Boyden [12] has added somewhat to the confusion in a very convincing series of experiments by finding that the gallbladder expels its contents by the force of its own musculature. The contraction is slow, thus providing a sustained flow of bile during the first phases of digestion. His experiments with epinephrine suggest that the gallbladder is under the partial control of the sympathetic nervous system, and by the results obtained from transfusion with the blood of yolk-fed donors, he believes that the gallbladder is not an inert organ nor does it merely respond to the digestion of food, but is sensitive to such general bodily conditions as effect changes in the circulating blood. The recent paper by Whitaker [13] is the best summary of our present knowledge that has yet appeared, and contains references to the many important contributions which he has made during the last two years.

Every one is now familiar with the technic of the Lyon drainage, except that I notice that few of the clinicians use the roentgen ray to determine whether or not the tube is in the duodenum. Originally the importance of the B bile was stressed and was ascribed to the effects of stasis in the gallbladder, but later Rous and McMaster [14] showed the normal concentrating power of the gallbladder to be very great. It was natural to suppose that the B bile represented this concentrated fraction; but because B bile can be obtained from patients whose gallbladders have been removed, and for other reasons, many writers assert that B bile does not come from the gallbladder. Rous and McMaster [15] have shown that the action of the duct system is that of dilution; hence, we cannot conclude that stasis occurs in dilated hepatic ducts after cholecystectomy. Martin [16] has converted B bile into C bile and vice versa by changing the hydrogen ion concentration, and it may be that such changes occur in the duodenum through the influence of the gastric or pancreatic secretions.

At operation, a sediment of soft material of bile pigment is sometimes found in the common duct, but again it is often absent, and certainly I would hesitate to insist on this as a criteria of gallstones in the gallbladder, although some recent studies by Bockus [17] are very convincing. Generally, the present tendency is toward a skepticism regarding the importance of bacteria brought up in the bile fractions as an indication of infection of the biliary passages. Besides, all modern evidence points to the conclusion that the mere presence of bacteria in the gallbladder does not necessarily mean the existence of a cholecystitis. This has been brought out best by Graham, who in 1918 and subsequently stated that in many cases, probably in a majority, cholecystitis represents a direct extension to the wall of a gallbladder from a liver already the seat of hepatitis. In 1921 Judd [18] said: "A review of our studies inclines us to believe that cholecystitis rarely exists without hepatitis." The possibilities for argument opened up by consideration of this point are so great that space permits only a few dogmatic statements. Graham believes that infection is brought to the liver by the portal vein, and he is partial to the appendical origin of this infection. A pericholangeitis then occurs, and the organisms moving in the lymphatics of the liver reach the wall of the gallbladder and produce the cholecystitis. The infection may go farther and involve the lymphatics about the common duct and pancreas. The theory is attractive and has much to commend it. Many of my patients have given a history of an acute attack with slight fever, colic, liver soreness and even slight jaundice, which subsided, and then later they developed belching and epigastric fulness after eating. At operation nothing was found in the common duct to account for the jaundice, but the condition of the gallbladder and some adhesions indicated the past infection. A number of the recent cases, without jaundice, show a van den Bergh reading around 1 unit, which again suggests liver injury. Of course, the older theory of the occurrence of a mild cholangeitis and mucosal infection of the gallbladder will suggest itself, but the anatomic arrangement of the branches of the portal vein make less likely the descent of infection in the bile and favor the lymphatic extension.

The fundamental importance of stasis of bile in the gallbladder as a factor in gallstone formation has long been recognized, and to the older theories the factor of a primary cholecystitis from the hepatitis, stiffening the wall and so interfering with emptying as to favor precipitation of the cholesterol and pigment under certain conditions, can now be added. How this occurs is well explained by Aschoff [19] in one of his lectures.

During the period from Sept. 1, 1922, to Jan. 1, 1927, there have been 282 operations on the biliary passages in my services at the University and Misericordia hospitals. Among these were forty-two cases of chronic cholecystitis without stones. The clinical phenomena defy analysis, the duration varying from a few weeks to twenty-five years. Colic or upper abdominal pain, fulness after eating, gas and nausea predominated, and the symptoms differed from those of the stone group only in that severe colic was rarely present. In three patients pain was mostly to the left. The ratios of females to males, the number of pregnancies, the previous infections and the other factors so often mentioned showed nothing out of the ordinary. Jaundice had occurred in five. It may be significant or not, but the van den Bergh reaction averaged 0.87 in those not visibly jaundiced on admission. Ten of the patients had been operated on previously for chronic appendicitis, and in one half of these various gynecologic procedures had been added. Only three patients remembered having had typhoid previously. Four patients had attacks of arthritis, but only one had a tachycardia or other evidence of myocardial change.

As a transverse incision was made in thirty-two cases, this would represent the percentage in which I was certain of the diagnosis. In the others a right rectus incision was performed, so that any possible stomach lesion could be detected and operated on if necessary. This occurred only once, a tight pylorus being found and a Rammstedt pyloroplasty done. Cholecystectomy was the method in thirty-seven, and cholecystostomy in five. One patient had had a cholecystostomy performed for gallstones ten years previously. In twelve cases the gallbladder was noted as "thickened"; in twenty-four there were pronounced adhesions; in one there was a hydrops, and five were noted as normal in appearance. There was evidence of cirrhosis of the liver in three, and a pancreatitis in two.

12. Boyden, E. A.: Anat. Record **30**: 333 (Aug.) 1925.
13. Whitaker, L. R.: The Mechanism of the Gallbladder and Its Relation to Cholelithiasis, J. A. M. A. **88**: 1542 (May 14) 1927.
14. Rous, Peyton; and McMaster, P. D.: Proc. Soc. Exper. Biol. & Med. **22**: 215, 1920.
15. Rous, Peyton; and McMaster, P. D.: J. Exper. Med. **34**: 75 (July) 1921.
16. Martin, Lay: Biliary, Pancreatic and Duodenal Studies, Arch. Int. Med. **39**: 343 (March) 1927.
17. Bockus: Personal communication to the author.
18. Judd, E. S.: Relation of Liver and Pancreas as to Infection of Gallbladder, J. A. M. A. **77**: 197 (July 16) 1921.
19. Aschoff, Ludwig: Lectures on Pathology, Origin of Gallstones, New York, Paul B. Hoeber, 1924.

In 1925 I was under the impression that when there was a distinct pathologic condition I would get favorable results from operation, whereas when the gallbladder was removed in a nearly normal state the results would be unsatisfactory. But such has not proved to be the case. There was some authority for this opinion, because Judd found that when the gallbladder was markedly diseased, 70 per cent of the patients were cured. On the other hand, Olch in both groups found his end-results 100 per cent perfect, "all of the cases having been followed up and in every instance there having been complete relief of symptoms." In fifty-two of his cases there was little or no gross pathologic change; in eight the thick scarred gallbladder was noted.

In my series of forty-two patients thirty-two report that they are in perfect health at the present time. That is, they do not have pains, recurrence of previous symptoms, abnormal indigestion, or hernia. This is 76.2 per cent of cures. Of the other ten, one died three months later, following an operation in another hospital, the nature of which I could never find out, and nine complain of pain or gastric distress, but with one exception state that they are better in the sense that they do not have "attacks." A few other facts might be mentioned. Drainage was done in only 65 per cent of the total group, whereas it was done in 80 per cent of the non-perfect cases. The appendix was removed in one-half the cases in both the cured and uncured groups. All of the nine patients had thick gallbladders or adherent gallbladders, or both. Five patients with normal gallbladders, yet with definite symptoms and cholecystectomy, say that they are entirely well. In all, cholecystectomy was performed. The following is a tabloid statement of the troubles of these patients:

1. Pain, gas and indigestion. Roentgen-ray examination showed colon stasis; two and one-half years later has gas and indigestion.

2. Symptoms of high chronic appendicitis. Roentgen ray showed colon stasis. Had postoperative hemorrhage. Fifteen months later still complains of abdominal pain.

3. Acute radiating pain attacks and indigestion. Nineteen months later has indigestion and heartburn.

4. Severe pain, indigestion and gas. Four months later has distress after eating.

5. Left epigastric pain and nausea. No ulcer but pylorus seemed tight, so Rammstedt added. Sixteen months later still has pain.

6. Radiating pain, indigestion and gas. Twenty-two months later less indigestion and gas.

7. Pain and nausea. Fourteen months later, left pain and nausea. (Earlier, suspension of uterus, and removal of appendix.)

8. Dull pain over gallbladder. Six months later gastric distress (cholecystostomy ten years previously).

9. Acute pain and nausea. Six months later, the same symptoms were present.

I would judge from my examination of these patients that the imperfect end-results were due to errors in complete diagnosis, errors in technic, to persisting adhesions. If these factors are eliminated there is the final factor to consider; namely, loss of the physiologic function of a normal gallbladder. Olch asserts that cholecystographic diagnosis is 100 per cent correct, even when gross or even microscopic examination of the gallbladder does not show abnormality. Apparently, therefore, it is necessary only to elicit definite or indefinite symptoms of gallbladder disease and to give the dye test. If this shows abnormality, cholecystectomy will result "in complete relief of symptoms." Lahey [20] advocates removal of the gallbladder if there are adequate symptoms unrelieved by treatment, irrespective of the normal appearance of the external walls of the gallbladder. I am unable at this time to venture an opinion as to my own thought in this matter; my experience must increase before I can do so. At present, I am inclined to agree with Walton Martin [21] that "the proof that a very slight infiltration of the gallbladder wall and lipoid deposit in the mucosa can cause acid indigestion, a feeling of fulness in the epigastrium, flatulence, intermittent gastric pain after eating badly prepared food, is by no means conclusive." It is interesting to note that Olch found that chronic hepatitis is constantly associated with chronic cholecystitis, no matter how slight the latter may be. But all of Olch's cases were cured and Judd,[22] in a series of twenty-eight patients with cholecystitis and hepatitis, found that twenty-four were practically well. Evidently, hepatitis is of little importance in the end-result, the well known ability of the liver cells to regenerate compensating for any harm done by the infection.

20. Lahey, F. H.: Boston M. & S. J. **196**: 677 (April) 1927.


SUMMARY

In a series of cases of chronic noncalculous cholecystitis treated with cholecystectomy, there were only 76.2 per cent of cures. Errors in diagnosis and technic are believed responsible for the failure to effect a cure. Cholecystography seems a certain method of diagnosing the ability of the gallbladder to fill, concentrate and empty. As an indication for cholecystectomy in the absence of gross demonstrable lesions, the method needs further study if avoidance of the unnecessary removal of a useful organ is sought.


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## ABSTRACT OF DISCUSSION

DR. LESTER R. WHITAKER, Boston: I wish to emphasize one possibility with regard to the noncalculous gallbladder, and that is that gallstones may be produced and then may be extruded, leaving a normal appearing gallbladder.

DR. J. EARLE ELSE, Portland, Ore.: A condition that is responsible for the continuation of symptoms following the removal of a gallbladder for a pathologic condition is pancreatic deficiency caused by chronic pancreatitis secondary to gallbladder disease. I have had a chance to observe very carefully a patient of this type. This woman gave a history of long standing biliary disturbance. On account of the increasing attacks, we decided, in spite of the fact that she was 74 years old, that a cholecystectomy must be done. She got marked but not complete relief. Occasionally she would have pain in the upper portion of the abdomen, nausea and vomiting of bile. The condition was carefully worked out, and it was discovered that she had a deficiency in fat digestion. She was put on a fat-free diet and was completely relieved. Being an old lady, not entirely in sympathy with modern ideas, every once in a while she breaks over and takes fat. As sure as she does it, she has a recurrent attack of upper abdominal pain, nausea and vomiting of bile. During the past year she has had a few of these attacks and every single one of them has followed the taking of fat; so far as I know she never has taken fat at any time except when she has had these attacks. That is a thing we must consider, and not only encourage early operation but also, when these attacks occur, find out whether the disturbance is due to a deficiency in fat digestion, and if so, keep the patient on fat-free diets.

DR. GEORGE P. MULLER, Philadelphia: Unless we consider partial functional disturbance as the chief element in the production of symptoms, it is hard to understand why there is a greater percentage of noncures in cases of chronic cholecystitis

21. Martin, Walton: Ann. Surg. **85**: 535 (April) 1927.

22. Judd, E. S.: Relation of the Liver and the Pancreas to Infection of the Gallbladder, J. A. M. A. **77**: 197 (July 16) 1923.

than in the calculous group. Judd showed that with an ascending scale of pathologic changes there was an increasing percentage of good results. One would suppose that with more adhesions and more hepatitis the chance of getting good results would be less, but apparently these patients do just as well as if not better than those in whom cholecystectomy has been performed for incipient disease. We must think clearly in the next few years regarding the matter of cholecystography because there must be variations in different individuals, and patients with visceroptosis or other abdominal adhesions are likely to be advised to have cholecystectomy if cholecystography indicates a functionally deficient gallbladder. We shall then be in the same position as we were a few years ago when the removal of a so-called chronic appendix was so common.

## HOST SUSCEPTIBILITY TO TYPHOID, DYSENTERY, FOOD POISONING AND DIARRHEA *

LLOYD ARNOLD, M.D.
CHICAGO

One of the notable achievements in preventive medicine has been the control of the communicable diseases spread largely through alvine discharges. This has been accomplished by limiting the distribution of the typhoid bacillus by sanitary measures and, to a lesser extent in the civilian population, by specific prophylactic immunization. My purpose in this communication is to call attention to certain new factors that influence the distribution of bacteria in alvine discharges, and, what is even of greater importance, changes in the susceptibility of the host due to disturbances of the normal gastro-intestinal functional activities.

The acidity of the gastric contents acts as a barrier to the passage of viable bacteria into the small intestine. Recent workers have shown that this is not a trustworthy germicidal agent under ordinary circumstances.[1] Bacteria introduced directly into the duodenum are usually killed before reaching the large intestine. Arnold and Brody [2] have recently studied the bacterial killing power of the gastro-intestinal tract by the use of certain new methods. Table 1 shows the average results

TABLE 1.—*Bacterial Flora and Hydrogen Ion Concentration of the Small Intestine of Normal and Fever Dogs*

| | Normal Dog | | Fever Dog | |
|---|---|---|---|---|
| | Bacterial Flora | $p_H$ | Bacterial Flora | $p_H$ |
| Duodenum | Streptococcus fecalis, a few | 5.2–6.2 | Fecal bacterial flora | 7.0 to 7.7 |
| Jejunum, upper half | | 5.5–6.5 | | |
| Jejunum, lower half | Streptococcus fecalis; coli-aerogenes, a few | 6.7–7.0 | | |
| Ileum | Fecal bacterial flora | 7.0–8.0 | | |

obtained in several experiments using normal and fever dogs. The upper half of the small intestine is slightly acid in reaction and contains relatively few bacteria. The contents of the lower portion of the small intestine are neutral or slightly alkaline in reaction and contain a fecal type of bacterial flora. When the whole of the small intestine is made alkaline, the bacterial flora are always of the fecal type.

Table 2 shows the change that takes place in the endogenous duodenal bacterial flora, and the alterations in the peripheral distribution of leukocytes after the injection of an aqueous alkaline buffered solution directly into the lumen of the duodenum of healthy dogs.

The stomach secretes acid into its lumen in order to acidify the contents, and usually there is a slight excess of acid. The material entering the duodenum is saturated with acid. The free acid is quickly neutralized by the alkaline pancreatic and hepatic secretions, and the combined acid is liberated more slowly, which accounts for the slightly acid reaction of the duodenum and upper jejunum. When the contents of this part of the intestinal tract are slightly acid in reaction, something is produced by the healthy intact mucous membrane that causes the destruction of bacteria. We think that this is probably a bacteriostatic substance; after devitalization or inhibition of the power of reproduction, these bacteria are destroyed by the normal digestive processes.

In our work with dogs we were unable to cause a diminution in the hydrochloric acid secretion of the stomach by various diets.[2] This substantiates the work of Lim and Ni,[3] who used histamine injections for the same purpose. The gastric acidity of man can be diminished even by a high protein diet.[4] This illustrates the

TABLE 2.—*Bacterial Flora of Duodenum and Peripheral Leukocytes Before and After Alkalization of the Small Intestine of Normal Dogs* *

| Bacterial Flora of Duodenum | Time | White Blood Cells | Percentage Polymorphonuclear Leukocytes |
|---|---|---|---|
| Streptococcus fecalis, a few isolated | Before experiment | 9,000 | 62 |
| | 30 minutes after | 17,000 | 85 |
| | 1 hour after | 18,500 | 87 |
| | 1½ hours after | 19,000 | 94 |
| Very rich flora, coliaerogenes and Streptococcus fecalis | 2 hours after | 24,500 | 88 |

* Average of six dogs, eighteen experiments; 50 cc. of phosphate solution ($p_H$ 8.9 at 37 C.) injected into duodenum.

greater susceptibility of the gastric secretory mechanism in man to various changes that cannot be detected in the laboratory experimental animal.

Summer diarrhea in infants has been considered from this standpoint.[5] The increase in the external temperature and the relative humidity interfere with the heat-regulatory mechanism of the infant. The gastric mucosa does not concentrate acid in its lumen when there is an elevation of the internal temperature. The upper part of the small intestine becomes alkaline, and the normal bacterial killing power is absent. This leads to the endogenous infections described by Moro or the usual nutritional disturbances and diarrhea. The feeding of acid-buffered foods helps to correct this condition.[6]

The bacteria that are suspended in water and given to a fasting dog do not appear in the cecum. When the same bacteria are suspended in alkaline solutions they appear in the cecum in less than an hour after ingestion and remain there for at least four hours. Acid solutions of the same molecular concentration have an entirely different action (chart 1). The bacteria used

* From the Department of Bacteriology and Pathology, University of Illinois College of Medicine.

* Read before the Section on Preventive and Industrial Medicine and Public Health at the Seventy-Eighth Annual Session of the American Medical Association, Washington, D. C., May 19, 1927.

1. Cornwall, J. W., and LeFrensis, H. M.: The Mechanism of Infection by B. Typhosus, Indian J. M. Research **11**: 883 (Jan.) 1924. Bartle, H. J., and Harkins, M. J.: The Gastric Secretion: Its Bactericidal Value to Man, Am. J. M. Sc. **169**: 373 (March) 1925.

2. Arnold, Lloyd; and Brody, L.: Bacterial Flora and Hydrogen Ion Concentration of the Duodenum, J. Infect. Dis. **38**: 249 (March) 1926; The Gastroduodenal Bactericidal Mechanism, Am. J. Hyg. **6**: 672 (Sept.) 1926.

3. Lim, R. K. S., and Ni, T. G.: Changes in the Blood Constituents Accompanying Gastric Secretion, Am. J. Physiol. **75**: 475 (Jan.) 1926.

4. Hoelzel, F.: The Effect of Variations in Protein Intake on the Acidity of the Secretion of the Fasting Stomach, Am. J. Physiol. **77**: 166 (June) 1926.

5. Arnold, Lloyd: Diarrhea in Infants, Arch. Pediat. **44**: 71 (Feb.) 1927.

6. Arnold, Lloyd: Influence of Acidified Milk on Duodenal Function in Infants, Am. J. Dis. Child. **31**: 668 (May) 1926.

were not killed in vitro in either the acid or the alkaline solutions.

The bacteria injected into the duodenum of dogs during active digestion are destroyed before reaching the cecum. The elevation of the external temperature and humidity causes, among other things, a diminution in the hydrochloric acid secretion of the stomach. Under all conditions of diet and with all our dogs, the disinfecting power of the gastro-intestinal tract was markedly interfered with when the animals were put in "summer temperature" rooms (chart 2). Bacteria injected into the duodenum of dogs in the "summer temperature" rooms are not killed in the intestinal tract as they are in the cooler rooms.

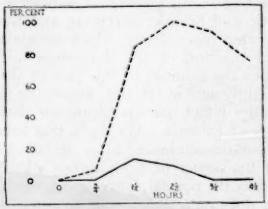


Chart 1.—Ordinate, percentage of viable bacteria appearing in the cecum of dogs after administration by mouth; abscissa, time cecal contents were examined after ingestion of bacteria; continuous line, 15 cc. of twenty-four hour old broth suspension of chromogenic bacteria in 300 cc. of acid phosphate solution (*pH* 5.0); broken line, same bacterial suspension in 300 cc. of alkaline phosphate solution (*pH* 8.5).

The bacteria ingested by the normal individual with his food seldom reach the lower part of the small intestine. If the gastric secretion is diminished and pathogenic bacteria are ingested, there is no reason to think from our experimental evidence that these bacteria would not have an opportunity to invade the susceptible host. The conditions that lead to a sudden lowering of

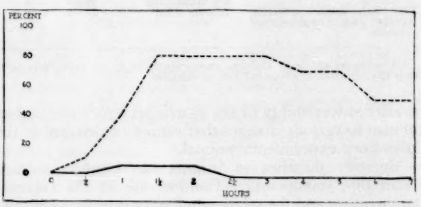


Chart 2.—Ordinate, percentage of viable bacteria appearing in cecum of dogs after administration by mouth; abscissa, time cecal contents were examined after ingestion of bacteria; continuous line, room temperature 50 F., relative humidity 40 per cent. One agar slant of B. prodigiosus added to 300 Gm. of bread and 300 cc. of meat broth.

the gastric secretory function increase the susceptibility of the individual to those diseases usually conveyed by alvine discharges. The carrier of typhoid or paratyphoid should have more bacteria in the feces when the usual disinfecting process of the intestinal tract is interfered with from any cause. The highest incidence of carriers of typhoid bacilli has been reported from India[7] and Alabama;[8] these observations can be explained and would be expected to occur as a result of the interference with the normal bactericidal power of the intestinal tract. Bacteria introduced with the bile into the duodenum will appear in the feces in greater concentration when the biologic autosterilizing mechanism of the intestinal tract is not effective.

7. Semple, D., and Greig, E. D. W.: An Enquiry on Enteric Fever in India, Scientific Memoirs by Officers of the Medical and Sanitary Department, Government of India, number 32, 1908.

8. Leach, C. N.; Dehler, Sophie A., and Havens, L. C.: The Prevalence of Carriers Among Recovered Typhoid Patients, Am. J. Pub. Health **16**: 391 (April) 1926.

When there is a sudden diminution in gastric secretion, in our experiments, there has always been a decrease or even a loss of the power of the alkalized intestinal tract to kill bacteria within its lumen. This lengthening of the sojourn of pathogenic bacteria ingested by mouth in the lumen of the intestinal tract cannot help but increase the hazard of invasion of the susceptible mucosa by those bacteria.

There should be a greater distribution of typhoid bacilli during the hot months of the year, because of an increased elimination of these bacteria by chronic biliary carriers. The same external environmental conditions would make the nonimmune population more susceptible

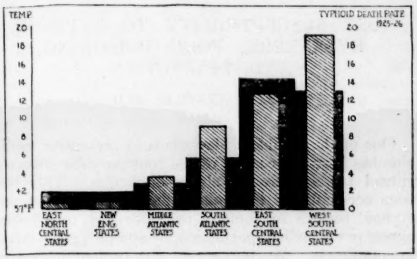


Chart 3.—Ordinate, left side, degrees above 57 F., of the annual mean maximum temperature; right side, typhoid death rate per hundred thousand of population in large cities of United States, 1925-1926; abscissa, U. S. Public Health Service geographic groupings of states: black area, typhoid death rates; crossed area, annual mean maximum temperature.

to the disease. Chart 3 shows the relation of the annual mean maximum temperature [9] to the typhoid death rate in the large cities in various sections of the United States.[10] The susceptibility of the individual to typhoid during summer vacation periods of the year is well known. Such abuses as overexertion, irregularity of

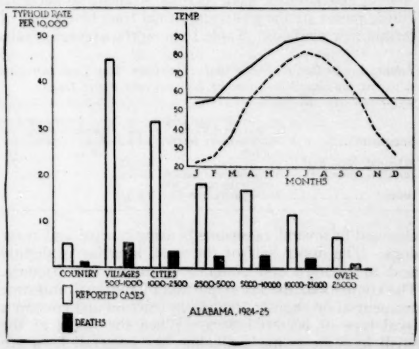


Chart 4 (taken from Leach and Maxcy).—Typhoid morbidity and mortality in Alabama in cities, towns and country districts. Inset: ordinate, annual mean maximum temperature; abscissa, months; continuous line, Alabama; broken line, Minnesota.

meals and overeating facilitate the passage into the lower level of the small intestine of the ingested bacteria that under normal physiologic conditions would be killed

9. U. S. Dept. of Agriculture Weather Bureau Bull. W, Summary of Climatological Data by Sections, ed. 2, 1926.

10. Typhoid in the Larger Cities of the United States in 1926: Fifteenth Annual Report, J. A. M. A. **88**: 1148 (April 9) 1927.

before reaching this portion of the intestinal tract. The increased distribution of the causative agent by chronic carriers takes place under the same conditions. The gastro-intestinal diseases appearing in epidemic forms after floods, fires and earthquakes are to a great extent due to the causes mentioned. The temperature and humidity of the kitchen should make a "typhoid carrier" cook a rather constant carrier.

The residual typhoid level will be dependent on the distribution of the typhoid bacilli and the susceptibility of the population to the disease. In those geographic areas where the temperature is relatively high for nine or ten months of the year, the "normal typhoid" rate should be relatively high as compared to a cooler climate. Water, milk and sewage are not under sanitary control in small villages, and the people in such small communities maintain an intimate or close contact with each other. The typhoid rates should be high for such small communities in a southern climate because of the factors that we have attempted to bring out in the experiments mentioned. Leach and Maxcy [11] have analyzed the typhoid morbidity and mortality in Alabama in cities, towns and country districts. Chart 4 is copied from their report. The high incidence of the disease in villages of a population ranging from 500 to 1,000 is very apparent. The inset chart shows the relation of the annual mean maximum temperature by months for Alabama and Minnesota. The relation of temperature to the increased distribution of *Bacillus typhosus* by chronic carriers, their better chance of survival and probably multiplication outside the body, combined with a greater susceptibility of the population to the disease because of an interference with the normal gastro-intestinal bactericidal mechanism—all these factors taken together make the typhoid problem in Alabama more difficult to handle than in Minnesota.

When meat infected with *B. enteridites* is fed to young dogs at ordinary temperatures, ill effects are not noticed. When the same infected meat is fed to young dogs in the "summer temperature" rooms, the dogs become inactive and sluggish, and an analysis of the gastric contents shows little or no acid. At times these dogs vomit from one to two hours after the meal. If the same infected meat is heated to boiling and fed to young dogs in the warm rooms, they usually vomit within one or two hours; there is practically no secretion of acid by the stomach, and diarrhea develops after four or six hours. These results substantiate and extend the observations recorded by Savage and White in England.[12] Toxic substances that cause a sudden suppression of gastric hydrochloric acid secretion lead to a rapid alkalization of the gastro-intestinal tract and are accompanied by symptoms of irritation of this tract.

The employment of sanitary measures to diminish or restrict the distribution of the causative agent of the communicable gastro-intestinal diseases has been proved our best weapon for prevention in the civilian population. The added protection enjoyed by preventing invasion of the intestinal mucosa by specific prophylactic immunization has also been proved a sure safeguard for the individual.

## CONCLUSIONS

The distribution of the causative agents of the gastro-intestinal diseases should be restricted by proper sanitary measures.

The invasion of the intestinal mucosa by the causative agent should be prevented by specific prophylactic immunization.

The normal gastro-intestinal bactericidal mechanism should be maintained by proper diet and other hygienic measures. This will tend to decrease the elimination by the feces of *B. typhosus* and *B. paratyphosus*, by chronic biliary carriers. It will also increase the resistance of the host to ingested pathogenic bacteria by causing their destruction in the upper part of the intestinal tract before they reach the lower levels and invade the body.

706 South Lincoln Street.

11. Leach, C. N., and Maxcy, K. F.: The Relative Incidence of Typhoid Fever in Cities, Towns and Country Districts of a Southern State, Pub. Health Rep. **41**: 705 (April 16) 1926.
12. Savage, W. G., and White, P. B.: An Investigation of the Salmonella Group with Special Reference to Food Poisoning, Medical Research Council, Special Report Series, number 91, 1925.

## ABSTRACT OF DISCUSSION

DR. HAVEN EMERSON, New York: I think we ought to welcome particularly the kind of presentation that Dr. Arnold has made, because it tends to get us away from that expression of generalities which has covered our ignorance of the causes which determine the summer incidence of intestinal infections in children, and the prevalence of intestinal disease of more specific character in certain climates of the world the year round. I do not know how many of you are familiar with Dr. Arnold's contribution to the epidemiology of infant mortality from diarrheal diseases in the large cities. Dr. Arnold showed that there was a considerable correlation between the conditions unfavorable to normal gastric secretion and the development of intestinal causes of death in infants. Certainly, in New York, over a considerable period of time, we have, in general, attributed this mortality to the unfavorable hygienic conditions that prevail in hot weather in the cities. Dr. Arnold's paper represents another contribution of experimental medicine to the study of what we have referred to by the general term of unhygienic conditions. It gives a tangible explanation for the physiologic changes in the body of the child brought about by climatic conditions, which up to the present time we have not been able to control. In his autobiography, Dr. Victor C. Vaughan describes how he and his wife took one of their children who was desperately ill with dysentery; from the depressing warm Middle West up to the cold region of northern Michigan, conceiving that they saved the child's life by a sudden change of climate. The same thing is written in the history of many white people in oriental countries who go to the hills as a life-saving measure when intestinal disease attacks their children. There are hospitals that have attempted to use artificial cooling rooms as a means of restoring the digestive reactions of infants to normal physiologic equilibrium.

DR. G. H. WOOD, Detroit: I should like to ask whether in these experiments Dr. Arnold included any dilution of the gastric contents with water, either at the time of feeding or soon after?

DR. LLOYD ARNOLD, Chicago: In answer to Dr. Wood's question, in the typical experiments we gave the animals bacteria suspended in water; under these conditions the bacteria never reached the large intestine. Water was always kept in the hot room for the dogs. Dr. Emerson mentioned the problem of infant mortality from diarrheal diseases in relation to external temperature and relative humidity. The same physiologic mechanism is operating in the baby as in the adult. The infant does not possess the same power of adaptation, and consequently the disturbance is more marked. The sudden changes from low to relatively high temperatures seem to place a strain on the gastro-intestinal bactericidal mechanism. It has been observed that cooks are often typhoid carriers. If cooks are carriers, they should be persistent carriers under their environmental conditions. As to lead poisoning, theoretically a hyperacidity should increase the susceptibility to poisoning. Milk and alkaline waters would tend to neutralize acid in the stomach. It is the acid salts of lead that are most soluble. In closing, I wish to emphasize the importance of investigating typhoid, bacillary dysentery, diarrhea and "food poisonings" from the standpoint of the influence of certain environmental factors on the susceptibility of the host to these diseases.

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SATURDAY, SEPTEMBER 3, 1927

## ARTIFICIAL RIPENING OF FRUITS BY ETHYLENE

The rapid ripening of fruits by gases of incomplete combustion—the so-called bivalent compounds—has been known for ages; long ago the Chinese used incense fumes to ripen pears. Today, the problem of ripening the fruit after it has been removed from the plant in a yet immature state is of greater commercial importance than ever in the history of the world. Fruits and vegetables are demanded by the consuming public, irrespective of the season. Oranges, tomatoes, pineapples, green beans, peas and celery can now be obtained on the market practically the year round. This has necessitated quick dispatch of the perishable commodities, and also speedy delivery to the ultimate consumer before decay sets in. To avoid decay, it is the generally accepted practice to pick the fruits and vegetables, such as tomatoes, while still green. Even then, for instance in winter in Minnesota, it is not uncommon for half a carload of tomatoes to be spoiled by the heat treatment, or so-called "sweating" process. Furthermore, the fruits and vegetables suffer loss in the organoleptic properties—relative sweetness, juiciness and flavor. Of particular moment from the marketing standpoint is the appearance of the product. A golden yellow orange has a much greater sales appeal than one with less beauty, even though the latter may have better eating qualities. One needs only to consult the Notices of Judgment of the Food and Drugs Act to be reminded how often the offense has been committed of artificially dyeing oranges in order to mislead the buying public. Now, it seems, this method of deception is to go into the discard. Ethylene, with its unusual history, is the reason.

The effects of ethylene and other constituents of artificial and natural illuminating gas on plants have been the subject of investigations by Crocker and Knight,[1] Shonnard,[2] and E. M. Harvey.[3]

The shipping of carnations by express had an unfavorable influence, the flowers "going to sleep" and buds not opening; the cause was found to be the escape of the illuminant Pintsch gas, which consists largely of ethylene. Some years later these observations were the means of suggesting to Luckhardt the possibility of the use of ethylene as an anesthetic, which, in the space of a few years, has become one of the most widely used general anesthetics. About four years ago Chase and Denny,[4] working in the U. S. Bureau of Chemistry, reported that the color of oranges and lemons could be made "natural" by exposing the immature fruits to an atmosphere of ethylene. The coloring of oranges by this "legal" method instead of by the use of the forbidden dyes has since become a current practice. Three years ago, R. B. Harvey[5] of the University of Minnesota Experiment Station found that larger applications of ethylene than those used by Denny, or of propylene or acetylene, speeded up the ripening processes in fruits and vegetables. In an article in the *Chemical Bulletin* recently, Harvey states that in the treatment of celery with ethylene the sugar content increased from 20 to 30 per cent over the controls. Similar changes occur in bananas, tomatoes and other fruits ripened with ethylene. Ethylene may be used to remove the excess acidity of fruits or vegetables, to remove chlorophyl from celery or similar plants, to increase the sugar content, or to remove tannins and other objectionable substances. Tomatoes ripened after removal from the vine in winter are liable to be excessively acid, but if treated with ethylene they are reported to have a fine flavor, free from excess acidity. Very immature tomatoes down to an inch in diameter may be ripened in from six to eight days; more mature fruits require only from twenty-four to sixty hours, depending on the variety and degree of maturity. According to Harvey, a single dose of ethylene, about 2 or 3 cubic feet, costing less than 40 cents to the carload of fruit, is sufficient to produce a remarkable change in the time necessary to ripen bananas and to change their color, flavor and texture.

The mechanism of the reaction does not seem to be well worked out. The ethylene is reported "to cause a sudden jump in the respiratory rate after its application." Attendant with this increased rate, the concentration of the fruit acids and tannins becomes less. Recently, Rea and Mullinix[6] report that an enzyme need not be present, as has been thought, for the conversion of starch to sugar by the action of ethylene. The presence of ethylene alone seems sufficient. The investigators offer the suggestion that the gas (as far as its action on starch is concerned) acts as a catalytic agent. This action, of course, is apart from the discoloring action of ethylene on the chlorophyl.

1. Crocker, William; and Knight, L. I.: Effect of Illuminating Gas and Ethylene on Flowering Carnations, Bot. Gaz. **46**: 259-276, 1908.
2. Shonnard, F.: Effect of Illuminating Gas on Trees, Dept. Public Works, Yonkers, N. Y., pp. 1-48, 1903.
3. Harvey, E. M.: Some Effects of Ethylene on the Metabolism of Plants. Bot. Gaz. **60**: 193-214, 1915.
4. Chase, E. M., and Denny, F. E.: Use of Ethylene in the Coloring of Citrus Fruit, Indust. & Engin. Chem. **16**: 339 (April) 1924.
5. Harvey, R. B.: Use of Ethylene in Chemical Ripening of Fruits and Vegetables, Chem. Bull., April, 1927, p. 101.
6. Rea, Helen E., and Mullinix, R. D.: Action of Ethylene on Pure Starch, J. Am. Chem. Soc. **49**: 2116 (Aug.) 1927.

While all this is of vast commercial importance, the health phases have not yet been thoroughly considered. Certain fruits and vegetables are recommended by physicians largely because of their vitamin content; whether or not this is altered by ethylene has not been determined. Possibly, also, the fruits and vegetables may be picked earlier than is the practice today, thus shortening the period of irradiation by the sun. Physicians may well watch the development of this form of food enterprise; perhaps the time may come when certain everyday foodstuffs will be purchased on the basis of vitamin units. In the meanwhile, the use of vitamin-containing products in as near a "naturally ripened" condition as possible should be encouraged when used for prophylaxis against avitaminosis.

## RECENT ADVANCES IN PERNICIOUS ANEMIA

Recently THE JOURNAL[1] referred to an address delivered in this country by Knud Faber,[2] in which the well known Danish clinician reaffirmed that pernicious anemia may be caused by intestinal intoxication, that achylia gastrica favors this process, and that the source of the toxic material is elsewhere than in the intestine when pernicious anemia develops in the course of an acute septic disease. Whatever the cause, if protracted hemolysis supervenes, the hematogenic organs become exhausted. Wells ventured the suggestion that this exhaustion may be enhanced by toxic substances in the blood. Knowledge of the important work of Whipple and Robscheit-Robbins,[3] Gibson and Howard,[4] and others,[5] seems to have been lost to the general medical reader along with other material on dietotherapy of anemia. THE JOURNAL comment, therefore, substantially summarized the general knowledge of pernicious anemia up to the time of publication.

Less than a month later THE JOURNAL published an article by Minot and Murphy[5] in which they related their results with forty-five patients suffering from pernicious anemia and to whom they had administered "a diet composed especially of foods rich in complete proteins and iron—particularly liver—and containing an abundance of fruits and fresh vegetables and relatively low in fat." Improvement was prompt and rapid, but they felt that enough time had not elapsed to justify full confidence in the treatment. In the same issue was printed a paper by Koessler, Maurer and Loughlin.[6] These authors believed that in some cases, at least, the phenomena accompanying pernicious anemia are the result of long continued deficiency in vitamin A and possibly also in vitamins B and C. The deficiency may arise from underfeeding or from insufficient utilization. The results obtained enabled these investigators to conclude, "The routine use of a rationally balanced diet which has proved itself thus far of decided value in the blood regeneration of patients suffering from severe anemias, aplastic as well as erythroblastic, is the most promising procedure in the treatment of certain anemias, especially pernicious anemia." Koessler and his associates thought, however—as Minot and his colleagues had considered of their own efforts—that insufficient time had elapsed to pass final judgment on their procedure. In the spring of the next year, Murphy, Monroe and Fitz,[7] reported the blood changes obtained under the Minot and Murphy regimen, and were able to corroborate the improvement reported by these authors.

Perusal of the papers by Minot and Murphy[8] and by Koessler and Maurer,[9] which appear in this issue, shows that, in the main, these two authorities are in considerable agreement regarding the means they would employ to combat pernicious anemia. Each would prescribe an adequate general diet, including a large quantity of liver and kidney. The principal difference with respect to diet is that Minot and his co-workers would reduce the fats, whereas Koessler and his associates declare that "butter, cream, milk and cod liver oil are supreme sources of fat soluble vitamins and should be partaken of in large amounts." In this view of the vitamins lies the essential difference in standpoint of the two groups of investigators. Minot and Murphy have shown that a nonprotein fraction of liver produces benefit in pernicious anemia and that this fraction is apparently not one of the known vitamins. Koessler, on the other hand, although he credits the discoveries of Minot and Murphy, is convinced that any treatment ultimately will be ineffective which does not provide for a copious supply of vitamins in the diet. Work by Macht,[10] also reported in this issue, ingeniously demonstrates that the blood serum of patients with pernicious anemia contains a toxin, and that this blood serum can be detoxified by irradiation with ultraviolet rays. Furthermore, he found that the effect of ultraviolet rays could be increased by introducing into the serum to be treated various dyes which act as sensitizers. This was tried not only in vitro but also in vivo, with encouraging results. These discoveries suggested to Macht yet another explanation of the benefit derived from the liver diet; namely, that since the liver is a storehouse for blood pigments, "some of these pigments may help increase the effectiveness of light in this disease."

1. Speculations About Pernicious Anemia, Current Comment, J. A. M. A. **87**: 249 (July 24) 1926.
2. Faber, Knud: The Intestinal Origin of Pernicious Anemia, Am. Clin. Med. **4**: 788 (April) 1926.
3. Whipple, G. H., and Robscheit-Robbins, F. S.: Favorable Influence of Liver, Heart and Skeletal Muscle in Diet on Blood Regeneration in Anemia, Am. J. Physiol. **72**: 408 (May) 1925, cited by Minot and Murphy.
4. Gibson, R. B., and Howard, C. P.: Metabolic Studies in Pernicious Anemia, Arch. Int. Med. **32**: 1 (July) 1923.
5. References are given by Minot, G. R., and Murphy, W. P.: Treatment of Pernicious Anemia by a Special Diet, J. A. M. A. **87**: 470 (Aug. 14) 1926.
6. Koessler, K. K.; Maurer, Siegfried; and Loughlin, Rosemary: The Relation of Anemia, Primary and Secondary, to Vitamin A Deficiency, J. A. M. A. **87**: 476 (Aug. 14) 1926.
7. Murphy, W. P.; Monroe, R. T., and Fitz, Reginald: Changes in Composition of Blood in Pernicious Anemia, J. A. M. A. **88**: 1211 (April 16) 1927.
8. Minot, G. R., and Murphy, W. P.: A Diet Rich in Liver in the Treatment of Pernicious Anemia, this issue, p. 759.
9. Koessler, K. K., and Maurer, Siegfried: The Treatment of Pernicious Anemia with a High Caloric Diet, Rich in Vitamins, this issue, p. 768.
10. Macht, D. I.: Pernicious Anemia: An Experimental Contribution to the Etiology, Diagnosis and Treatment, this issue, p. 753.

The immediate future has much to offer with regard to the etiology and treatment of pernicious anemia. The developments of present importance are that methods of combating the disease have been devised which have given results so encouraging that men of recognized scientific and clinical judgment are advocating them: (1) liver diet, (2) feeding of foods of high vitamin content, and (3) ultraviolet irradiation with or without the adjuvant use of sensitizing dyes.

### SOME CURRENT TENDENCIES IN VITAMIN RESEARCH

It has been only a few years since the alphabet was requisitioned, so to speak, for the specific designation of a series of food factors as yet chemically undefined but nevertheless clearly essential to physiologic well being. Although vitamins A, B, C, D and E have thus found their way into the scientific literature of the present day, it is by no means certain, if indeed it is even probable, that the list of these heretofore unidentified dietary constituents which insure proper nutrition has been exhausted. While the existence and importance of some of the designated vitamins have now been generally accepted, others have remained the subject of considerable debate. Thus, opinion has been divided as to whether there is any vitamin, such as E is alleged to be, that is specific for the reproductive functions. Several investigators have contended that, if the diet is adequately supplied with all the other known essentials, no further precautions are required to bring about not only satisfactory growth but also the bearing of young in a favorable way.

Studies by Sure[1] at the University of Arkansas tend to substantiate the view that there are special dietary requirements that insure fertility. This amounts to a defense of vitamin E. His observations further support the belief that lactation also makes special demands that must be properly met in the supply of food to the mother. Since cod liver oil is at present being highly vaunted as the bearer of conspicuous nutritional advantages, it deserves to be emphasized, on the basis of Sure's experiments, that its special contribution consists in vitamins A and D, not in vitamin E. Experimental diets in which cod liver oil has been the only source of fat-soluble vitamins have proved to bring only failure of fertility. An added factor is required. As in the case of the antirachitic vitamin (D), the potent component is not the food fat per se but a nonsaponifiable fraction of certain animal and plant oils. There is no longer any doubt that the fat of milk carries vitamin E; but the butter fat is not as rich in this factor as is wheat oil, for example.

Another feature of some practical importance developed in Sure's studies is that the requirements of vitamin B for normal mammary gland function are considerably greater than for optimal growth. This is not surprising when one considers that the production of milk is in many respects comparable with the elaboration of new tissue in the body. Both are essentially processes of growth. With increments in size, individuals require comparably larger supplies of vitamin B.[2] Contrary to some of the common beliefs, Sherman and Gloy[3] of Columbia University have found no basis for the assumption that the vitamin B requirement is noticeably influenced by the protein intake. Another feature of interest has been established by investigators[4] at the Michigan State College through the demonstration of the apparent connection between the chlorophyl or greenness of edible leaves and their content in vitamin A. Thus the outside, green leaves of head lettuce were richer in this factor than the inside yellow leaves; and leaf lettuce excelled head lettuce in the same respect. These facts, which have been indicated in various earlier studies, have an obvious bearing on dietary practices.

1. Sure, B.: Dietary Requirements for Reproduction: Papers VIII, IX, X, XI, J. Biol. Chem. **74**: 37 (July) 1927.

2. Sherman, H. C., and MacArthur, E. H.: A Quantitative Study of the Determination of Vitamin B, J. Biol. Chem. **74**: 107 (July) 1927.

3. Sherman, H. C., and Gloy, O. H. M.: Vitamin B Determination and Requirement, with Special Reference to Protein Intake, J. Biol. Chem. **74**: 117 (July) 1927.

4. Dye, M.; Medlock, O. C., and Crist, J. W.: The Association of Vitamin A with Greenness in Plant Tissue, J. Biol. Chem. **74**: 95 (July) 1927.

5. When a Muscle Contracts, editorial, J. A. M. A. **84**: 442 (Feb. 7), 1925; Muscle Work and Protein Metabolism, ibid. **85**: 195 (July 18), 1925; Lactic Acid and Muscular Function, ibid. **86**: 1217 (April 17), 1926.

## *Current Comment*

### BLOOD LACTIC ACID AFTER HEMORRHAGE

It can no longer be doubted that lactic acid, $C_3H_6O_3$, is an important factor in the intermediary metabolism of the body. The substance has long been recognized in a haphazard way to have biochemical significance without awakening more than vague conceptions regarding what its occurrence really represents. Students were taught for many years to identify lactic acid in muscle tissue, and occasionally the compound was isolated from the urine under conditions that might be regarded as abnormal or pathologic. Today, however, the conversion of glucose into lactic acid in the body, and conversely of lactic acid into glucose and glycogen is regarded as definitely established. During muscular contraction the glycogen of the contractile tissue is diminished in amount while lactic acid and inorganic phosphates are formed in equimolecular amounts. These are the fundamental facts on which current theories of the energy transformation in muscular work are based. In recovery from contraction, most of the lactic acid formed is reconverted into glycogen. The energy for this reconversion is derived from the oxidation of part of the lactic acid or its equivalent of glucose produced from the glycogen. From these considerations, which have been reviewed from time to time in THE JOURNAL,[5] it is apparent why lactic acid arises in tissues in unusual amounts only in the absence of an adequate supply of oxygen.

It may make its appearance in augmented amounts in the blood after severe exercise while there is an oxygen deficit as the result of the unusual demands for the element. After severe hemorrhage there is almost necessarily a diminished oxygen supply owing both to the reduction in the respiratory pigment hemoglobin and to the decreased volume of blood circulating. Under such conditions Riegel[6] of the University of Pennsylvania has found the concentration of lactic acid in the blood, into which it readily diffuses from the tissues, to be increased, the extent of its augmentation depending on the severity of the hemorrhage. This suffices to explain the decrease in the hydrogen ion concentration and in the alkali reserve of the blood long since recognized to follow extensive losses of the circulating medium. The adjustment to the evident anoxemia occasioned by hemorrhage is prompt; for, according to Riegel, the concentration of lactic acid in the blood becomes normal again long before the hemoglobin content is restored. The methods whereby lactic acid is taken care of have also been investigated by Riegel.[7] Some of the catabolite is directly oxidized. The rest is probably synthesized to lactacidogen and glycogen by a process analogous to the removal of lactic acid formed in muscular exercise.

## EXPERIMENTAL SCARLATINAL NEPHRITIS

The kidney lesions that frequently attend scarlet fever are among the most distressing and serious of the sequelae of a disconcerting disease. All too often they have permanent consequences that seem to be out of all proportion to the more transitory character of the etiologic infection. As happens in the case of almost all maladies, progress in both the elucidation of the precise nature of the attendant disorders and the discovery of helpful therapeutic or prophylactic procedures would be made if the malady could be produced experimentally for the purposes of study. Not long ago Duval and Hibbard[8] of the Tulane University of Louisiana School of Medicine demonstrated that a typical experimental nephritis can be produced in rabbits with the toxic principle of *Streptococcus scarlatinae*. They[9] have now succeeded also in producing a scarlatinal nephritis in the dog both with the culture and with the toxic principle of the microorganism. The acute lesions thus induced are of two kinds, glomerular and interstitial; and these appear to be alike in type and variety to the histopathologic renal changes in human scarlet fever. The glomeruli are first affected when the toxin alone is introduced, whereas the primary interstitial lesion occurs in the animals inoculated with the living cultures and in which a generalized infection has resulted. The Tulane pathologists have pointed out that the complete analogy of the experimental nephritic lesion in the dog to that in man affords the opportunity to study the acute lesions in the order of their related sequence and is a means of tracing the changes that lead to a progressive diffuse nephritis.

6. Riegel, C.: Formation of Lactic Acid in the Body After Severe Hemorrhage, J. Biol. Chem. **74:** 123 (July), 1927.
7. Riegel, C.: The Rate of Disappearance of Sodium Lactate Intravenously Injected and Its Effect upon Sugar and Inorganic Phosphate of the Blood, J. Biol. Chem. **74:** 135 (July), 1927.
8. Duval, C. W., and Hibbard, R. J.: J. Exper. Med. **44:** 567 (Oct.) 1926.
9. Duval, C. W., and Hibbard, R. J.: Scarlatinal Nephritis Experimentally Induced in the Dog, Proc. Soc. Exper. Biol. & Med. **24:** 876 (June) 1927.

## THE CIRCULATORY RESPONSE TO REBREATHING CARBON DIOXIDE

The growing realization that the carbon dioxide tension of the alveolar air and correspondingly of the blood exerts a regulatory effect on the respiration of man has led to the development of certain practical applications. Thus, it has been proposed to employ carbon dioxide in conjunction with volatile anesthetics such as ether and to administer it along with oxygen when rapid restoration of normal blood composition is desired. One procedure has involved the actual addition of the carbon dioxide to the respired gases; another is represented in the scheme of rebreathing the latter—a device whereby the concentration of carbon dioxide becomes gradually increased through accumulation of the expired product. The alveolar tension of the gas then soon rises and thereby necessarily affects its concentration in the circulating blood. Certain incidental effects of such a course have recently been described from the University of Rochester School of Medicine and Dentistry by Goldstein and Du Bois.[1] There is an unmistakable increase in both the systolic and the diastolic blood pressure in man. The heart rate is augmented as the carbon dioxide tension is increased. During the recovery period these various functions return to normal with somewhat unlike speed, but usually quite promptly. The explanation of the reported changes is as yet by no means clear, though it seems likely that various tissues besides the respiratory center respond to enforced increments in the tension of carbon dioxide to which they may become exposed. From a practical standpoint it is particularly important to know what the nature of the consequent blood pressure is.

## THE METABOLISM IN OBESITY

Interest in the problem of obesity has become accentuated in the last few years through the circumstance that overweight is deprecated from esthetic standpoints as well as through consideration of its undesirability on the basis of the outlook of good health. There is no doubt that obesity is frequently the result of overnutrition, particularly when this is combined with lack of muscular exercise. This simple hypothesis of a favorable balance of food intake over energy output is not convincing, however, as a universal explanation. At any rate, it does not make clear why some persons fail to gain despite all efforts to increase their food consumption, and why some seem to gain despite an apparently moderate regimen. Furthermore, in many instances obesity seems to have an hereditary background as though there were a constitutional predisposition as well as the consequence of liberality in diet. Indeed, a distinction is sometimes drawn

1. Goldstein, J. D., and Du Bois, E. L.: The Effect on the Circulation in Man of Rebreathing Different Concentrations of Carbon Dioxide, Am. J. Physiol. **81:** 650 (Aug.) 1927.

between so-called exogenous obesity—attributed to inactivity and overfeeding—and an endogenous or constitutional type for which a variety of physiologic or pathologic functions have been held responsible.[1] A group of Chicago investigators[2] at the Michael Reese Hospital have expressed the belief, on the basis of careful measurements of the respiratory metabolism, that the combustion of the nutrients is altered in many of the obese. Thus they have found a greater rise in the respiratory quotient of the latter than in normal persons after meals, and hence conclude that less fat is burned in the corpulent organism. Hagedorn[3] and his associates in Copenhagen have verified these metabolic observations. However, they insist that the rise in the respiratory quotient is what was to be expected when a transformation of carbohydrate into fat takes place to a greater extent than in persons of normal weight. The Danish clinicians therefore defend the hypothesis that obesity is due to a qualitative anomaly in metabolism; that is, an abnormally increased transformation of carbohydrate into fat.

## Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

### ARKANSAS

**Department Heads Appointed.**—Dr. Carl Sneed Williamson, formerly of the Mayo Clinic, Rochester, Minn., has been appointed head of the department of surgery at the University of Arkansas School of Medicine, Little Rock, and Dr. Oliver C. Melson, formerly of the Mayo Clinic, has been appointed head of the department of medicine.

**Society News.**—Dr. Edward C. Mitchell, Memphis, Tenn., addressed the Mississippi County Medical Society, Blytheville, July 12, on "Diagnosis and Treatment of Diarrheas in Children," and Dr. John J. Shea, Memphis, Tenn., on "Urologic Problems of Interest to the General Practitioner."—— Dr. Joseph S. Westerfield addressed the Faulkner County Medical Society, July 21, Conway, on "Pellagra."——The Union County physicians were hosts to the Tri-County Medical Society (Columbia, Ouachita and Union), July 5, at a banquet. The next meeting will be in Magnolia, October 4.

### FLORIDA

**Personal.**—Dr. Festus E. Kitchens, assistant to the director of public health of Coral Gables, has resigned to engage in practice. —— Dr. Joseph N. Fogarty, who recently tendered his resignation as mayor-commissioner of St. Augustine and as chief surgeon of the Florida East Coast Railway, has located in Daytona Beach to engage in practice.—— Dr. James Q. Folmor has been appointed superintendent of the state hospital at Tallahassee to succeed Mr. W. B. Knott, who has been appointed state auditor and who, in 1921, succeeded Dr. Henry Mason Smith as superintendent of the hospital.——Dr. John C. Turner, Jr., has been chosen chairman of the board of health of Miami to succeed Mr. A. W. Ziebold, resigned, who will continue as a member of the board. —— Dr. Thomas H. Johnston, Marianna, recently resigned as field medical officer with the state board of health to take up the position of health officer of Coffee County, Georgia.——Dr. Florentine P. Herman, West Palm Beach, has been appointed a member of the state board of medical examiners.

1. Grafe: Ergebn. d. Physiol. **21**: 197, 282, 1923.
2. Wang, C. C.; Strouse, Solomon; and Saunders, M. D.: Metabolism of Obesity: IV, Arch. Int. Med. **36**: 397 (Sept.) 1925.
3. Hagedorn, H. C.; Holten, C., and Johansen, A. H.: The Pathology of Metabolism in Obesity, Arch. Int. Med. **40**: 30 (July) 1927.

### ILLINOIS

**Personal.**—A farewell party was given by the staff of the Lincoln State School and Colony, Lincoln, August 13, to Dr. and Mrs. Alexander L. Darche, who have been transferred to the staff of the East Moline State Hospital, East Moline. —— Dr. Duncan D. Moore, Edwardsville, has been appointed secretary of the Madison County Medical Society to succeed the late Dr. Edward W. Fiegenbaum of Edwardsville.

**Society News.**—Dr. Arthur Dean Bevan, clinical professor of surgery, Rush Medical College, Chicago, addressed the Lee and Ogle county medical societies at Lowell Park, near Dixon, August 18, on "Surgical Aspect of Gallbladder Disease," illustrated by lantern slides. Dr. Joseph L. Miller, clinical professor of medicine, Rush Medical College, Chicago, also addressed the society. This outdoor meeting has become an annual affair; it is attended by physicians from many cities in northern Illinois.

**Diphtheria More Prevalent.**—There were 3,038 cases of diphtheria reported in Illinois the first half of this year, a figure 36 per cent greater than for the same period in 1926, and the greatest incidence reported since the first half of any year since 1924. There appears to be a generally increased prevalence rather than local outbreaks or sporadic epidemics. The state department of health states that reports from all over the United States show a similar situation throughout the country. The department warns that children about to enter school for the first time this fall should be immunized against diphtheria, as more than half the deaths from this disease occurred among children under 7 years of age. Usually, the upward trend in the number of cases becomes noticeable about the middle of September.

### INDIANA

**Hospital News.**—The Marion County Tuberculosis Sanatorium, Sunnyside, will hold its annual homecoming for former patients, September 18. The new building to be dedicated at this time includes an infirmary, medical building, nurses' home and an added story to the old administration building. These will add 100 beds to the capacity of the sanatorium, and enable it to care for 300 patients.

**Society News—Correction.**—THE JOURNAL, August 6, noted that Dr. John C. Knight, Jonesboro, was a host to the Wabash and Grant county medical societies at their joint meeting, July 21. The name should have been Dr. Everett D. Knight, Lafontaine. —— At the August meeting of the Lawrence County Medical Society, Bedford, Dr. Roland E. Wynne, Bedford, addressed the society on pulmonary tuberculosis, and Dr. John T. McFarlin, Williams, on puerperal fever.

### IOWA

**Appointments at Medical School.**—President Jessup, of the University of Iowa, Iowa City, announced, July 13, it is reported, the appointments of Dr. Albert V. Hardy as acting head of the department of epidemiology; Alvin W. Bryan, D.D.S., as acting head of the department of psychiatry, and Dr. Dean M. Lierle as acting head of the department of otolaryngology.

**Society News.**—Dr. Isidor H. Tumpeer, Chicago, addressed the Dubuque County Medical Society, recently, on "The Simplicity of Infant Feeding and Other Hazards"; Dr. Allen Graham, Cleveland, "Graves' Disease from the Standpoint of the Surgeon"; Dr. Kellogg Speed, Chicago, "Unhappy Results in the Treatment of Fractures," and Dr. Daniel V. Conwell, Iowa City, "The Spinal Fluid in Diagnosis."—— Dr. Engelke J. Ringena, Brooklyn, addressed a joint meeting of the Jasper and Poweshiek county medical societies, Newton, recently, on "Scarlet Fever."——Among others, Dr. Walter H. Nadler, Chicago, addressed the Des Moines Valley Medical Association, recently, at Ottumwa, on "Liver Feeding in Pernicious Anemia," and Dr. Montrose T. Burrows, St. Louis, on "Cancer."——The Davis County Medical Society was host to physicians of Van Buren, Wapello and Appanoose counties at a basket picnic at the Bloomfield Country Club, July 21.

### KENTUCKY

**Action Taken in Infantile Paralysis Outbreak.**—The state health officer, Dr. Arthur T. McCormack, Louisville, announced that about twenty-four cases of infantile paralysis had been reported, must of them in Georgetown and Scott counties, and that the assistance of Dr. William L. Aycock, Burlington, Vt., had been obtained to prevent the spread of the epi-

demic. Dr. Aycock addressed a meeting of physicians and health officers in Lexington and visited, in conjunction with others, most of the patients with infantile paralysis. Children have been forbidden to attend movies, church and the fair as a precautionary measure.

**Society News.**—Dr. William Mason, Stamping Ground, will address the September meeting of the Scott County Medical Society on "Scarlet Fever, Sequelae and Treatment," and Dr. Harvey H. Roberts, Georgetown, will address the October meeting on "Intoxication and Local Focal Points of Infection."——About 100 members of the Central Kentucky Medical Association from Mercer, Boyle and Garrard counties attended the meeting at Graham Springs Hotel, Harrodsburg, July 21. Dr. Fayette Dunlap, Danville, spoke on his experience in the yellow fever epidemic in New Orleans when a medical student, and Dr. Alice N. Pickett, Louisville, spoke on "Prenatal Care."——Dr. William E. Gary was host at a barbecue dinner to the Christian County Medical Society, August 16, at his home on Cox Mill Road. Dr. Virgil E. Simpson, Louisville, read a paper on "Cardiac Arrhythmias." The scientific meeting was held outdoors.

**Red Cross Undertakes to Move Columbus.**—In nineteen years, the Mississippi River has worn away the bluff on which the city of Columbus stands, so that forty-two houses have disappeared over the brink. The recent great flood left the main hotel of the town in the river where it is a menace to navigation. It has been decided, according to the *Red Cross Courier*, to move the town of Columbus to a new site on a high table-land. An expert is laying out the new site, and is providing for a central boulevard, a park, a community center and zones for resident and business districts. The Red Cross will move seventy-three houses as a rehabilitation measure, and new buildings are to replace those lost by the flood. Columbus, once a city of 6,000 people, and a railway and shipping center, was advocated by Thomas Jefferson as the best site, geographically, for the national capital. Time changed Columbus. The railways moved out; one electric line connects it now with a junction, and its population has decreased to about 700.

## LOUISIANA

**Sixteen Flooded Parishes Provide Funds for Health Units.**—Sixteen parishes in the flooded area have provided their quota of funds for a full-time health unit, and these will be supplemented by funds from the Rockefeller Foundation and the state board of health. It is expected that the units will be in operation within four weeks. Dr. John A. Ferrell of the Rockefeller Foundation conferred with officers of the state board of health, August 22. The U. S. Public Health Service will assist in providing personnel. A number of applicants for positions as directors, nurses and inspectors in these units will be sent to the training school at Indianola, Miss., which has been established by the International Health Board, and applicants who qualify at this school will be recommended for appointment as needed in the new health units. The school is under the direction of Dr. Charles N. Leach.

## MARYLAND

**Public Health Nurses in Every County.**—There are now one or more public health nurses in every county in Maryland; Allegany County leads with six; Baltimore County has four, and Anne Arundel, Carroll, Frederick, Montgomery and Washington counties each have three. Three colored nurses are now doing public health work, one in Frederick, one in Kent and one in Calvert County; they are directed by the deputy state health officer, and their work is limited to the colored people.

## MICHIGAN

**Personal.**—Governor Green has appointed Sister Mary Gannon, director of nursing service, St. Joseph's Mercy Hospital, Ann Arbor, a member of the state board of registration of nurses and training attendants.

**Division of Cancer.**—In cooperation with the cancer committee of the Wayne County Medical Society, the department of health of Detroit has established a division of cancer. It is hoped to develop a diagnostic service which will be available to the citizens of the city, and a follow-up system aimed to secure proper treatment. The department of health will not give any treatment or assume responsibility for the treatment, but will endeavor to see that the patient receives treatment. A study is being made to determine what types of cancer are most prevalent in Detroit, what structures are most commonly involved, and how long after onset treatment is instituted. This information will be made available to the physicians and to the public. The division of cancer in the department of health will be in charge of Dr. Harry C. Saltzstein, who has been active in the Detroit cancer campaigns.

## MINNESOTA

**Society News.**—At the fifty-ninth annual meeting of the Wabasha County Medical Society, Lake City, July 7, Dr. William P. Herbst, Jr., Minneapolis, gave an address, illustrated with a patient, on "Perinephritic Abscess"; Dr. Arnold S. Anderson, Wabasha, spoke on "Bovine Tuberculosis and Its Relation to Man," and Dr. William A. O'Brien of the University of Minnesota, on "The Cults and You," illustrated with lantern slides. Dr. Emery H. Bayley, Lake City, reviewed the discussion on immunization against scarlet fever and diphtheria held at the state sanitary conference in June. Dr. William J. Cochrane, Lake City, was elected president to succeed Dr. Joseph S. Collins, Wabasha.

**Children's Hospital at St. Paul.**—The new Children's Hospital, Inc., of St. Paul, is to be completed early next spring. The site was donated, and the building assured by generous contributions. It will be an endowed hospital for teaching students from the University of Minnesota Medical School, Minneapolis, and will have fellows from the graduate school of the university and the Mayo Foundation. Dr. Walter R. Ramsey will be the medical director. It is not entirely a charity hospital; patients will pay what they can afford. The building is sheltered from the north wind by a hill, and there are to be no rooms for patients on the north side. The roof has been converted into an open porch with shelter in front where the beds may be pulled. The Children's Hospital for the last two years has been housed in a temporary building. The new structure will cost about $150,000. All children up to 15 years of age will be accepted, except those having contagious disease.

## MISSISSIPPI

**Society News.**—Dr. Joseph M. Weldon, Mobile, Ala., addressed the August meeting of the Jackson County Medical Society on "Toxemia of Pregnancy," and Dr. William R. Bethea, Memphis, Tenn., on "Roentgen-Ray Study of the Thymus of Infants."——Albert G. Tillman, Jr., D.D.S., addressed the August 9 meeting of the Issaquena-Sharkey-Warren Medical Society, Vicksburg, on "Dental Focal Infection."——Dr. Robert R. Kirkpatrick, director of the Coahoma County Health Department, resigned, effective September 15, and will serve a year as intern in the Eye, Nose and Throat Hospital in Memphis.

**Woman's Auxiliary Aids Flood Refugees.**—The annual report of the Woman's Auxiliary of the Harrison-Stone Counties Medical Society shows that the auxiliary was of great assistance in relief work during the recent Mississippi flood. Two days after the state president called for infants' clothing for refugees, the Harrison-Stone Counties Auxiliary began to ship boxes with clothing and other necessities, and in all, sent 5,500 garments, including also children's and women's clothing, sheets, pillow cases and hospital supplies. The sewing and other work was done in the Woman's Club at Gulfport, which was placed at the auxiliary's disposal. The Singer Sewing Machine Company installed motor driven machines; the merchants donated or made special prices on materials; the daily papers featured the work, and the women of Gulfport generally assisted. The objectives of this organization at the beginning of the year were (1) to place *Hygeia* in each of the public schools in Harrison and Stone counties; (2) to devote time to the social needs of nurses in training in local hospitals, and (3) to foster more friendly relations among families of physicians, especially newcomers. These plans have been carried out in addition to the emergency work necessitated by the flood. Mrs. James A. McDevitt is president of the Harrison-Stone Counties Auxiliary; Mrs. Charles A. McWilliams and Mrs. James T. Weeks, vice presidents; Dr. Margaret R. Caraway, secretary; Mrs. Duke G. Mohler, corresponding secretary, and Mrs. Daniel J. Williams, treasurer.

## MISSOURI

**St. Louis Adopts Kahn Test.**—The St. Louis Health Division laboratories has adopted the Kahn test as a standard after four years of comparative study with the Wassermann test. Nathan Nagle, who has been appointed serologist in the laboratories, has for two years been assistant serologist in the laboratory of the Michigan Department of Health at Lansing, where he was associated with Dr. Kahn.

**Society News.**—Dr. Charles H. Mayo, Rochester, Minn., addressed the Jasper County Medical Society, recently, on the progress of surgery; about 175 members and guests attended the dinner from adjacent towns in Kansas, Oklahoma, Arkansas and Missouri; Dr. Fred W. Rankin, Rochester, read a paper on "Carcinoma of the Colon."——Dr. Hermon S. Major, Kansas City, addressed the Vernon-Cedar County Medical Society, recently, on "Mental Hygiene or Mental Health," and Dr. Harold P. Kuhn, Kansas City, on "Goiter."——The guests of the Daviess County Medical Society at its July meeting at Gallatin were Drs. Frank C. Neff and Russell L. Haden, Kansas City, who were sent by the postgraduate committee of the state association. Dr. Edward J. Goodwin, St. Louis, secretary of the state medical society, and Dr. Spence Redman, Platte City, councilor, among others from outlying districts, helped make the meeting one of the best; Dr. Neff talked on "Colitis" and had charge of the clinics; Dr. Haden's subject was "Anemia."

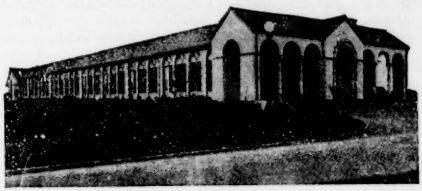
**The Beaumont Medical Building in St. Louis.**—Physicians and a few dentists occupy the entire ten floors of this building, which was recently erected at 3720 Washington Boulevard, St. Louis. No offices are rented to commercial firms. There is a twenty-five bed hospital on the second floor which is modern and fully equipped, with a physician constantly on duty at night, and a superintendent and supervisor of the operating rooms, of which there are four. There are three four-bed wards and eleven private rooms, each with a telephone and radio. The physicians who planned the building are all members of the St. Louis Medical Society. Stock was offered for sale and construction was not started until 75 per cent of the building had been rented under five and ten year leases. The building cost $1,000,000, which sum was raised in one day by the sale of bonds. It was at first intended to erect a five story structure, but the demand for offices increased, and eventually the foundations were made to permit the addition of five stories to the present ten story structure. The building is removed from the congested district, the tenants are selected by a committee, and an effort has been made to avoid the congregation there of any one particular group. Dr. Edwin C. Ernst is president of the Beaumont Medical Building Company; Dr. Martin F. Engman, vice president; Dr. Frederick J. Taussig, treasurer, and Dr. Ellis Fischel, secretary.

## NEW YORK

**Personal.**—Donald A. Laird, Ph.D., director, laboratory of psychology, Colgate University, Hamilton, has been promoted to professor and chairman of the department, and Paul Whitely, Ph.D., University of Chicago, has been appointed associate professor of psychology at Colgate.——Dr. Joseph Ivimey Dowling was elected president of the Eastern New York Eye, Ear, Nose and Throat Association at Riverwood, Schenectady, recently.

**Permanent Public Health Association for Buffalo.**—The public health association formed in Buffalo during the recent referendum on the enlargement of the city hospital is to be a permanent organization. It will supplement the efforts of the Erie County Medical Society, the Buffalo Academy of Medicine, the municipal health department and other public health agencies. Its president, Dr. Earl P. Lothrop, points out that these agencies do not admit the public into membership. The new organization will attempt to bring about active cooperation between laymen and physicians with regard to public health. Applications for enrolment in the Buffalo Public Health Association may be sent to the secretary, Dr. George R. Critchlow, 647 Lafayette Avenue.

**Another School for Crippled Children.**—Buffalo's School for Crippled Children has just graduated its first class. The new school building adjacent to the city hospital on Grider Street has, the municipal department of health states, every modern facility and convenience for comfort, including beautiful classrooms, an auditorium, a clinic, and shops and workrooms for sewing, cooking, printing and wood and metal working. Physicians examine candidates for admission to the school, and the children are carefully conserved during their attendance by the department of hospitals and dispensaries. Nurses are always in attendance, and the staff of the



city hospital is always available to preserve their health. Surgical attention is given when indicated and a number of children have been discharged as cured. Children with low intelligence are not accepted. The educational program is as thorough as resources permit. It includes an inquiry into the mental and physical background to determine the child's possibilities; a work, play, study and physical development program that will meet his needs, and a consideration of his vocational and avocational future. The city provides busses to take the children to the school and home again.

### New York City

**Large Gift to Fight Cancer.**—John D. Rockefeller, Jr., has given $60,000 a year for five years to the Memorial Hospital to aid in cancer research and in the education of specialists who can diagnose and treat cancer in its earliest stages. The gift was made some months ago, but only now has become generally known. Mr. Rockefeller specified, it is reported, that the money was to be used for laboratory and clinical research into the causes of cancer; for the education of specialists, so that cancer may be diagnosed and treated in its earliest stages, and for the improvement of the nursing staff of the Memorial Hospital.

**One Week of Demonstrations.**—The joint committee on medical education, representing the Medical Society of the County of Kings and the Long Island College Hospital, has arranged for one week of intensive general, medical and surgical demonstrations at Kings County Hospital, Brooklyn, September 19-24, where a great variety of clinical material is available. The demonstrations will cover gynecology, surgery, obstetrics, medicine, bronchoscopy, neurology, urology, dermatology, orthopedics, pediatrics and pathology. There will be fourteen instructors, the hours ranging from 8 a. m. to 4 p. m. The fee will be $30, and luncheon will be served daily to those taking the course. Applications and the fee should be sent to the Committee on Graduate Education, 1313 Bedford Avenue, Brooklyn.

**Officers of Rockefeller Foundation.**—Under the new plan of organization, the following are reported to be officers of the Rockefeller Foundation:

John D. Rockefeller, Jr., chairman, board of trustees.
George E. Vincent, president.
Edwin R. Embree, vice president in New York office.
Roger S. Greene, vice president in the Far East.
Selskar M. Gunn, vice president in Europe.
Frederick F. Russell, M.D., director, international health division.
Richard M. Pearce, Jr., M.D., director, division of medical education.
Norma S. Thompson, secretary.
Louis G. Myers, treasurer.
George J. Beal, comptroller.

The international health division comprises the president, the chairman, Dr. Simon Flexner, Vernon L. Kellogg, Wickliffe Rose and Dr. William Allen White. The division of medical education comprises the president, the chairman and Drs. David L. Edsall, Frederick Strauss, George H. Whipple and Ray Lyman Wilbur.

## NORTH CAROLINA

**Personal.**—Laurence H. Snyder, Sc.D., Raleigh, has been elected a foreign member of the Deutsche Gesellschaft für Blutforschung, as a result of his research work on the blood groups.

**Society News.**—Dr. William G. Bandy, Lincolnton, was elected president of the Tri-County Medical Society, July 12, at a meeting near Lincolnton. The guest of honor and the speaker was Dr. Henry F. Glenn, Gastonia, whose subject was "Medical Ethics."

**New Hospital for Negroes.**—The L. Richardson Memorial, a hospital for negroes at Greensboro, was recently opened. It is of the Spanish Mission type, fireproof, and well equipped. Dr. Watson S. Rankin, Charlotte, director of the hospital activities of the Duke Foundation, was the principal speaker at the opening ceremonies. The Duke Foundation will assist in defraying the expenses of the maintenance of this hospital, giving $1 each day for each bed maintained for charitable purposes.

## OHIO

**Personal.**—The Franklin County Board of Health has elected Dr. Percy B. Wiltberger, Columbus, county health commissioner to succeed Dr. Harry H. Snively.——Dr. Glenn G. Edwards, Willard, has been reelected president of the Willard Community Hospital Association.

**Society News.**—Dr. Jean P. Pratt, Henry Ford Hospital, Detroit, addressed the Four County Medical Society (Defiance, Fulton, Henry, Williams) at Napoleon, June 16, on "Dysmenorrhea," and Dr. Carroll H. Skeen, Napoleon, on "Economic Status of the Rural Practitioner."——Dr. Frederick B. Wishard, Anderson, Ind., addressed the Wayne County Medical Society, Wooster, June 23, on "Industrial Surgery."——Dr. Clarence L. Hyde, East Akron, addressed the Belmont County Medical Society, June 22, on "Tuberculosis."——Dr. Robert Carothers, Cincinnati, addressed the Columbiana County Medical Society at a meeting at Lake Placentia near Westville, July 14, on "Treatment of an Ununited Fracture"; at the business meeting the society adopted a plan of cooperation between the health departments and the local physicians to emphasize the importance of immunization and other forms of preventive medicine. A picnic dinner was served.——Dr. Arthur L. Pritchard, Nelsonville, president of the Eighth Councilor District, addressed the Muskingum County Academy of Medicine, Zanesville, July 6, on society business.——Dr. Eugene C. Beam, Columbus, addressed the Athens County Medical Society, June 6, Nelsonville, on "Management of Labor."——Dr. John H. J. Upham, Columbus, a trustee of the American Medical Association, addressed the Darke County Medical Society, recently, on "The Advancement of the Medical Profession," and inspected the Darke County health unit.

## SOUTH CAROLINA

**Personal.**—Lieut. Col. Marion H. Wyman, Columbia, Medical Corps Reserve, was ordered to active duty, September 1, at Carlisle Barracks, Pa., for a course of instruction to continue until about October 15.

**Physical Examination Campaign Opens.**—The two month campaign of the state medical society in the interest of periodic health examinations opened, August 1, at the regular meeting of the Greenville County Medical Society, Greenville, attended by about seventy-seven physicians and guests. The speakers included Dr. D. Lesesne Smith, Spartanburg, president of the state medical society; Dr. Olin B. Chamberlain, Charleston; Dr. Edgar A. Hines, Seneca, secretary, state medical society; Dr. Robert A. Strong, Pass Christian, Miss.; Dr. Frank H. Richardson, Black Mountain, N. C., and Brooklyn, and Dr. Francis B. Johnson, Charleston.

## TENNESSEE

**Public Health News.**—State and federal aid in public health work was discontinued, July 1, in Hamilton County because, it is reported, the county had not requested that it be continued; Dr. John W. Dennis, Chattanooga, formerly county health director, established a health unit in Washington County under the direction of the state department of health and with the cooperation of the county judge and county court.——A full-time county health unit has been established in Bradley County, with Dr. Horace M. Roberson, director.

**Gibson County's Annual Meeting.**—The thirty-fourth annual session of the Gibson County Medical Society was held at Humboldt, August 16, in Sharp's Theatre in the morning and in Bailey Park in the afternoon. The local physicians tendered a picnic and barbecue dinner. The scientific program comprised about nineteen papers; among the speakers were Dr. William D. Haggard, Nashville, "Care and the Cure of the Goiter Patient," with lantern slides; Dr. Eugene L. Bishop, Nashville, "Work of the State Health Departments"; Dr. William Battle Malone, Memphis, "Head Injuries," and Dr. William C. Chaney, Memphis, "Diagnosis of Pernicious Anemia."

**Society News.**—The Sevier County Medical Society held a banquet, August 10, at the Central Hotel, Sevierville. The president, Dr. Ashley W. Ogle, presided. Judge Ben Robertson spoke on the legal difficulties of physicians; Dr. Leon L. Sheddan, Knoxville, on "The Country Doctor versus the City Doctor"; Judge A. M. Paine, on "The Doctor in Court"; Dr. Carp S. Kinzer, on "Public Health"; Dr. Samuel R. Miller, Knoxville, on "Medical Organizations," and Dr. Ernest R. Zemp, Knoxville, on "Relation of the Practitioner to the Surgeon."——The first meeting of the Five Counties Medical Society (Hardin, Lawrence, Lewis, Perry and Wayne), Savannah, July 26, was attended by about thirty physicians and eight new members were admitted at this meeting. The local chapter of the Eastern Star served luncheon, and in the evening ice cream and cake were served on the courthouse lawn. Among the speakers were Dr. Odie C. Doty, Savannah, "Hydrophobia," and Dr. Charles F. Anderson, Nashville, "Urologic Cases" with lantern slides.——Dr. James E. Cottrell, Philadelphia, addressed the Knox County Medical Society in July on "Use of Ammonium Orthoiodoxybenzoate in the Treatment of Arthritis."——Dr. Harrison H. Shoulders, Nashville, addressed the Macon-Clay-Jackson Tri-County Medical Society in July on "Significance of Abdominal Pain."——Dr. Ernest R. Zemp, Knoxville, addressed the Roane, Monroe and London County medical societies, Rockwood, July 21, on "Land Marks in the Treatment of Cardiac and Circulatory Diseases"; Dr. Zemp and Drs. Samuel R. Miller, and Robert B. Wood, Knoxville, assisted, July 2, in the organization of a tricounty medical society in Hancock, Claiborne and Union counties.——Carroll, Henry and Weakley counties held their annual barbecue, July 12, near McKenzie. Among others, Dr. Duncan Eve, Jr., Nashville, read a paper on "Fractures of the Elbow," and Dr. Walter W. Robinson, Memphis, on "Serologic Diagnosis of Syphilis."——Dr. Lemuel F. Loggins, Charlotte, addressed the Dickson, Hickman, Humphreys Tri-County Medical Society, Centreville, August 2, on "Management of the Pneumonias."——The Franklin County Medical Society was reorganized, July 29, with Dr. Matthew M. Huling, Winchester, as president, and Dr. John P. Grisard, Winchester, secretary; the physicians of Grundy and Moore counties were invited to join the reorganized society; Dr. Jefferson C. Pennington, Nashville, addressed this meeting on "Urology," illustrated with lantern slides.——Dr. James A. Mitchell was host to the Coffee County Medical Society, August 4, at Tullahoma; Dr. Evander M. Sanders, Nashville, was the speaker.

## WEST VIRGINIA

**Personal.**—Dr. David Berman, health commissioner of Moundsville and Marshall County, tendered his resignation, effective, August 20, in order to accept a position as health commissioner of Victoria, B. C.——Dr. J. B. Lohan resigned as health commissioner of Charleston, effective August 1, and Dr. Hugh B. Robins was appointed to that position.——Dr. William A. Welton has been appointed superintendent of Fairmont State Hospital number 3, effective, September 1.

## GENERAL

**Memorial to Jacques Loeb at Woods Hole.**—A bronze plaque, commemorating the life and work of Jacques Loeb, was unveiled at the entrance to the auditorium at Woods Hole, Mass., August 4. Frank R. Lillie, Ph.D., president of the board of trustees of the laboratory and, until 1926, the director; Dr. Simon Flexner, Rockefeller Institute, New York, and Hardolph Wasteneys, Ph.D., of the University of Toronto Faculty of Medicine, gave addresses.

**Record Low Malaria Rate in Panama.**—The office of the Panama Canal Zone in Washington announced, August 15, it is reported, that the lowest malaria rate in the history of American occupation of the Canal Zone was experienced during the first six months of this year. The rate was 4.1 per thousand employees, while for the year 1926 it was 6.3. The number of employees is 13,506. Only two deaths due to malaria have occurred among employees during the last six and one-half years, and they occurred in 1924.

**Yeast Shipped South to Combat Pellagra.**—The American Red Cross has made an initial shipment of 5,000 pounds of powdered brewers' yeast to the flood areas of Mississippi, Arkansas and Tennessee to be used to combat pellagra, which, it is reported, is unusually prevalent. The action was taken on recommendation of the Surgeon General, U. S. Public Health Service, after a study of the situation by Dr. Joseph Goldberger. The yeast is to be distributed through the state health departments, local health units and the Red Cross.

**Society News.**—The American Psychiatric Association has been incorporated, in accordance with action taken at the annual meeting in 1926, and the National Association for the Study of Epilepsy has become a constituent part of the former organization. The *American Journal of Psychiatry* is now issued bimonthly instead of four times a year; Drs. Harry S. Sullivan, Towson, Md., and Clarence B. Farrar, Toronto, Canada, have been made associate editors, together with Dr. Arthur L. Shaw, Utica, N. Y., representing the National Association for the Study of Epilepsy.

**Health Work in Palestine.**—The Women's Zionist Organization of America, known as Hadassah, voted, June 25, to expend $609,000 in medical and health work in Palestine, most of which will be to support the Hadassah Medical Organization in that country. In addition to that budget, the organization voted to raise $100,000 from revenues for medical service in Palestine. The need for medical work in Palestine is considered urgent. The convention expressed its gratitude in a unanimous resolution to Nathan and Mrs. Straus of New York for their gift of $250,000 for a health center in Jerusalem.

**American Electrotherapeutic Association.**—Among the speakers at the thirty-seventh annual meeting of the American Electrotherapeutic Association, September 12-16, Hotel Pennsylvania, New York, will be Dr. Charles Ward G. Crampton, New York, on "The Menace of Commercialized Exercise," which will be a report of the committee on therapeutic exercise; Dr. A. Bern Hirsh, New York, "Progress of Education in Physical Therapeutics"; Dr. Samuel Dana Hubbard, New York, "Necessity for a Comprehensive Physical Therapy Law and Its Relation to Licensed Technicians"; Dr. John Inglis Parsons, Bournemouth, "Evolution and Tuberculosis"; Dr. Axel Reyn, Copenhagen, "Carbon Arc Therapy," and Dr. Foveau de Courmelles, Paris, "Idiosyncrasy to Phototherapy." Legally licensed physicians will be welcome to these meetings, to the clinics at hospitals and laboratories, and to the exhibit of apparatus and accessories. Physicians from various states will read papers and take part in the discussions.

**Notes from Otologic Congress.**—At the sixtieth annual congress of the American Otological Society, New York, recently, the first report of the American Commission on Otosclerosis was presented by the chairman of the committee, Dr. Norval H. Pierce, Chicago. It was announced that the Carnegie Foundation had given $90,000 to help finance research on otosclerosis by the commission under the auspices of the society, and that the commission had established permanent headquarters in the building of the New York Academy of Medicine. Prof. T. H. Bast, Ph.D., Chicago, read a paper on "Bone Formation in the Human Embryo: The Endolymphatic Duct in the Human Embryo." Dr. Samuel J. Crowe, Baltimore, read a paper on "Demonstration of Microscopic Sections of Temporal Bone in Otosclerosis." "The Problem of Progressive Deafness" was discussed by Henry S. Pritchett, LL.D., president of the Carnegie Foundation; Elmer E. Brown, LL.D., chancellor of New York University, and Dr. Edward B. Dench, New York. The newly elected president of the American Otological Society is Dr. Max A. Goldstein, St. Louis; Dr. John G. Wilson, Chicago, is vice president, and Dr. Thomas J. Harris, New York, secretary-treasurer (THE JOURNAL, May 28, p. 1736).

**Committee on Cost of Medical Care.**—Since the conference in Washington in May on the cost of medical care, the committee has been increased to about eighteen members and has met and elected officers. The committee is to serve a period of five years with the object in view (1) of conducting an analysis of the problem of medical organization particularly of its economic factors; (2) to plan research studies on the basis of the proposed analysis to be assigned to interested agencies and individuals to be subsidized only when they cannot be properly undertaken without financial aid; (3) to conduct a limited number of studies when it is evident they cannot be handled properly by any existing agency and (4) to arouse the interest of professional groups and the public in facts regarding medical service as they become available, particularly the results of the committee's studies. An annual budget of $40,000 has been adopted by the committee and of this sum the Twentieth Century Fund has made a grant of $10,000 subject to conditions, and the Milbank Memorial Fund a grant of $15,000. The temporary office of the committee is at 1724 I. Street, Washington, D. C. The last four members noted have been appointed on the executive committee with authority to increase their number. The committee includes the following:

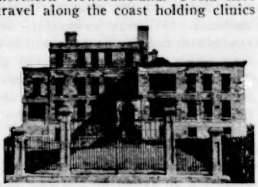
| | |
|---|---|
| Ray Lyman Wilbur, chairman | Winford H. Smith |
| Lewellys F. Barker | W. Irving Clark |
| John J. Carty | Mrs. W. K. Draper |
| William Darrach | William T. Foster |
| Walton H. Hamilton | Wesley C. Mitchell |
| Watson S. Rankin | William S. Thayer |
| Richard M. Smith | Charles Edward A. Winslow |
| Edgar Sydenstricker | Michael M. Davis, Jr. |
| Matthew Woll | Haven Emerson |
| Rollin T. Woodyatt | John Shelton Horsley |

**International Ophthalmologic Congresses.**—At a conference at Scheveningen, Holland, attended by delegates from twenty-five nations, it was voted to reestablish the International Congress of Ophthalmology which was interrupted by the World War. The American delegates to the conference at Scheveningen were Drs. George E. de Schweinitz, Philadelphia, formerly President of the American Medical Association, and Dr. Walter R. Parker, Detroit. Dr. Edward Jackson, Denver, and Dr. de Schweinitz were on the committee of English-speaking ophthalmologists appointed in 1925 to bring about a renewal of the international congresses. Much of the success of the convention at Scheveningen is said to have been due to the hosts, Professors van der Hoeve of Leyden, and Rochat of Gröningen, and Dr. Marx of Leyden. It was decided to hold the first congress at Amsterdam, September, 1929; new rules and by-laws were adopted; the subscription was fixed at £2 sterling for members and £1 sterling for associates. An international council was appointed to hold office until the next congress and voluntary subscriptions of not more than £5 are to be requested from medical societies and from individuals to meet its expenses. The council appointed comprises Professor van der Hoeve, chairman; Professor Lundsgaard, Denmark, vice chairman; Leslie Paton, Great Britain, treasurer; Dr. Marx, secretary; Professors Axenfeld, Germany; Coppez, Belgium; Marquez, Spain; Meller, Austria, and Ovio, Italy, and Drs. Byers, Canada; Morax, France, and de Schweinitz. Mr. E. Treacher Collins, Great Britain, was elected honorary president of the International Council. The conference was marked with friendliness. After business had been transacted, the delegates motored to Nordwyk-on-Sea to a luncheon given by Professor van der Hoeve, and then visited the new ophthalmologic clinic at Leyden.

**Annual Safety Congress.**—The sixteenth annual safety congress will be held at the Stevens Hotel, Chicago, September 26-30, under the auspices of the National Safety Council. The congress is organized into sections, and physicians will appear on the program of several sections. Dr. William D. Haggard, professor of surgery, Vanderbilt University School of Medicine, Nashville, Tenn., a past president of the American Medical Association, will address the general session, Monday afternoon. In the health service division, Tuesday afternoon, Dr. William A. Sawyer, medical director, Eastman Kodak Company, Rochester, N. Y., will speak on "The Health of Executives"; Dr. Royd R. Sayers, U. S. Public Health Service, on "Observations of Industrial Silicosis," and Dr. Otto P. Geier, of the Cincinnati Milling Machine Company, on "What Does the Health of Workers Have to Do with Industry." In the food section, Thursday morning, Dr. Arthur C. Selmon, Battle Creek, Mich., will speak on "Value of Physical Examinations in the Food Industry." In the chemical section, Wednesday morning, Dr. Patrick H. Hourigan, of the Larkin Company, Buffalo, will discuss "The Medical Department." Dr. Guy G. Dowdall, of the Illinois Central Railroad, Chicago, will address the steam railroad section, Wednesday afternoon. A moving picture entitled "What Does Your Baby Put in His Mouth," produced by Dr. Chevalier Jackson, Philadelphia, will be exhibited, Tuesday evening. In connection with the congress there will be a great collection of safety and related equipment, including what is new in the way of first aid and sanitary supplies and the latest equipment against accident, fire and health hazards. An outdoor demonstration in the Grant Park Stadium, Friday afternoon, will include a safety pageant by school children; a contest between first aid teams; safe driving contests; demonstrations between the fire and police departments, and a drill by school safety patrols. The toastmaster at the annual banquet, Wednesday evening, will be Lawrence McDaniel, St. Louis, attorney at law.

## CANADA

**New Hospital of Grenfell Association.**—The hospital shown here at St. Anthony, Newfoundland, is the head of all the medical work of the International Grenfell Association on the coast of Newfoundland and Labrador. It was dedicated, July 25, having been built entirely by local labor under the direction of the physician-in-charge, and almost entirely by contributions from people of the United States. At the dedication, physicians present from the Universities of Michigan and California said that it is one of the best planned and equipped hospitals that they had seen. It is the most northern, modern hospital on the east coast of North America and the only medical unit in northern Newfoundland. From here nurses and physicians travel along the coast holding clinics and otherwise ministering to the people. Patients from all over Newfoundland come to this hospital. The hospital, now a fireproof structure, replaces the old wooden building erected twenty-five years ago. It has been in charge of two Harvard graduates for the last twenty years, the late Dr. John Mason Little, Jr., from 1907 to 1917, and Dr. Charles S. Curtis, from 1917 to date. Dr. Wilfred T. Grenfell, who received his medical education at Oxford, England, and at the London Hospital, has been in medical missionary work in this region about thirty-five years. According to the *British Medical Journal*, he has brought about the building of four large hospitals, seven cottage hospitals, two orphanages, four public schools and numerous other institutions, and has raised an endowment fund for the maintenance of this work of £200,000. During the World War, he served in Europe with the Harvard University Surgical Unit. He has been honored by the King of England and Harvard and Toronto Universities, and was awarded the Murchison bequest of the Royal Surgical Society in 1911.



## FOREIGN

**Award for Research.**—According to *Science*, Dr. Charles Nicolle, director, Pasteur Institute in Tunis, has been awarded the Osiris prize, amounting to $4,000, for research on exanthematous typhus and recurrent fever, and on serotherapy in measles and scarlet fever. The prize is awarded every five years by a committee representing five academies.

**The King's Prizeman is a Doctor.**—Capt. Cecil H. Vernon of the Royal Army Medical Corps won the King's Prize at the shoot at Bisley, England, July 16. The prize is a gold medal, gold badge and £250. His score was 292. Captain Vernon, who is said to be the first member of the medical profession to win the prize, after his victory was carried around the camp in the prizeman's chair escorted by mounted Lancers and the Dorsetshire regiment. As a total abstainer, he declined the glass of champagne which awaits every prizeman at the offices. Captain Vernon is assistant surgeon and obstetrician to the Royal Victoria Hospital, Bournemouth; he was educated at Cambridge at St. Thomas' Hospital and was among the 100 competitors for the King's Prize in 1923, 1924 and 1925. He has been shooting in tournaments since about 1910.

**Personal.**—Prof. George Lovell Gulland has resigned from the chair of medicine at the University of Edinburgh, Scotland, having reached the age limit.——Dr. Allen Neave Kingsbury of the Colonial Medical Services, Institute of Medical Research, Federated Malay States, has been awarded the North Persian Forces Memorial Medal for 1926 for a paper on "Some Investigations of Malarial Fevers." The medal is awarded for the best paper on tropical medicine published during the preceding twelve months by any medical officer of less than twelve years' service in the Royal navy, army, air forces, Indian Medical Service or Colonial Medical Services.——Dr. John S. Manson, Lancashire, England, was awarded the Sir Charles Hastings Clinical prize at the Edinburgh meeting in July of the British Medical Association. The prize consists of an illuminated certificate and a check for fifty guineas for his clinical study entitled "Observations on Human Heredity." It was established by the association to encourage research, observation and record among the general practitioners.

# *Government Services*

### Newly Commissioned Medical Officers

Following the completion of one year as interns at U. S. Army hospitals, the following medical graduates have been commissioned first lieutenants in the Medical Corps of the Army to date from August 3. Their home address is given.

Ammons, Fletcher E., 518 Victoria Avenue, Hampton, Elizabeth City, Va.
Bachman, John P., 7143 Georgia Avenue, N.W., Washington, D. C.
Bradish, Robert F., 1306 Floral Street, N.W., Washington, D. C.
Burdick, William F., Route number 1, Uniondale, Susquehanna County, Pa.
Chester, John B., Montreat, Buncombe County, N. C.
Christmas, Thomas W. E., 772 W. Lombard Street, Portland, Multnomah County, Ore.
Council, Frank E., home address not given.
Craig, William R., 3605 Jackson Avenue, El Paso, Texas.
Dyke, Lester M., Orange City, Sioux County, Iowa.
Gill, James P., Jr., 106 Sunset Avenue, Dallas, Dallas County, Texas.
Glattly, Harold W., University Park, Mahaska County, Iowa.
Goodiel, Carlton D., 1337 Vermont Avenue, N.W., Washington, D. C.
Harshbarger, Jacob C., Port Republic, Rockingham County, Va.
Heaton, Leonard D., 103 East St. Catherine St., Louisville, Jefferson County, Ky.
James, William M., 1207 Jefferson Street, Springfield, Greene County, Mo.
Lavery, Henry B., 1045 Melrose Terrace, Dubuque, Dubuque County, Iowa.
Marvin, Horace P., Essex Junction, Chittenden County, Vt.
Messer, Frank W., home address not given.
Moore, George B., Jr., 146 Kayton Avenue, San Antonio, Bexar County, Texas.
Ransone, Marion W., 228 Mallory Avenue, Hampton, Elizabeth City, Va.
Redland, Arthur J., Ardsley, Montgomery County, Pa.
Seale, William H., home address not given.
Sloan, Ralph M., 320 Eleanor Avenue, San Antonio, Texas.
Smith, James B., Jr., 190 Alhambra Street, San Francisco.
Smith, Kenneth G., 848 Westover Road, Portland, Multnomah County, Ore.
Spittler, August W., home address not given.
Stewart, Harold LeR., home address not given.
Theis, Edward H., 2026 "C" Street, Granite City, Madison County, Ill.
Wakeman, Frank B., 603 North Academy Street, Valparaiso, Porter County, Ind.
Wilson, William B., 344 North Ellis Street, Cape Girardeau, Cape Girardeau County, Mo.
Wilson, William L., 918 Cedar Street, Apartment 2, El Paso, Texas.

### Two Deaths Following Administration of Typhoid Vaccine

The *U. S. Naval Medical Bulletin*, July, reports the death of a 17 year old recruit at San Diego following his third inoculation with antityphoid vaccine. The facts appear to be that the boy developed a severe reaction a few hours after inoculation, and died in about fifteen hours. A necropsy was performed, and an investigation made by a court of inquiry. The observations at the necropsy were general cyanosis; contractures of hands and feet; congestion and slight edema of the brain, and congestion of the lungs, liver, spleen and kidneys; the blood had not clotted twelve hours after death. The primary cause of death was charged as anaphylaxis, typhoid vaccine. Testimony before the court seemed to show that the boy had been quite sick after his second injection; that he was undersized, frail, and in poor physical condition; that he was given a full cubic centimeter dose, and that no definite provision was made for watching the effect. The testimony indicated also that a 10 cc. syringe was used and, although the hospital corps man who made the injection stated, positively, that he did not inject more than 1 cc. this, the report states, must be regarded as unsafe practice. The vaccine was straight typhoid vaccine, the navy having discontinued the use of triple vaccine in 1924. Another death reported is that of a sergeant, aged 35, who died after the third of a series of antityphoid inoculations, which were given seven days apart. He had not had any discomfort after the preceding injections. He died in about eight hours after the inoculation after developing a temperature of 102, and after having been seen by a medical officer twice in the evening. This case is recorded in the vital statistics of the navy with the primary cause of death as "myocarditis and valvular heart disease, combined lesions, aortic and mitral," and the secondary cause as "acute dilatation of the heart." The bulletin states that it is, of course, possible that the vaccine was the direct cause. A necropsy was made. The sergeant had been in the marine corps fourteen years, and had completed a course of antityphoid vaccine in 1912 and another in 1921. The two cases cited are the only ones in the naval service in which death could, in any manner, be attributed to antityphoid inoculations since November, 1924, when the use of straight typhoid vaccine was resumed.

# Foreign Letters

## LONDON

*(From Our Regular Correspondent)*

Aug. 13, 1927.

### Adoption of Calmette's Method of Preventive Inoculation Against Tuberculosis

After many years of work M. Calmette, director of the Pasteur Institute, Paris, and M. Guérin of the Pasteur Institute, Lille, have elaborated a promising method of preventive inoculation. The bacillus of bovine tuberculosis, by artificial cultivation carried on over a period of years, has lost its virulence, although it does not appear to have lost its power of conferring resistance against natural infection. Arrangements have been made by the British with the cooperation of MM. Calmette and Guérin to prepare the vaccine at the veterinary laboratory of the ministry of health. It will be issued for use in suitable herds in which tuberculosis exists, and which, from the prevailing conditions, seem most likely to give a definite answer regarding its efficacy. The idea is to vaccinate within the first fortnight of life all calves born or brought into the herd; to repeat the vaccination every twelve months, and to continue the operations over a period of about five years, by which time most of the older and tuberculous cows will, in the ordinary course, have been worked out of the herd, when it is expected that the latter will consist of adults which have been kept free from natural infection by vaccination. The material will be issued without cost to the owners of selected herds. Supervision of progress will as far as possible be carried out by the staff of the ministry, but owners will be expected to arrange with their veterinary surgeons to carry out the inoculations as from time to time calves fall due for vaccination. For testing the method in the first instance it is proposed to confine operations to pedigree herds and to dairy herds, the owners of which breed the calves destined to keep up the herd. If the method proves efficient, it will no doubt admit of much wider extension; but for the present it is not considered that herds in which constant sales of calves and purchases of cows are going on could furnish the evidence desired.

### Biochemical Institute for the Middlesex Hospital

The Middlesex Hospital, already distinguished by the Bland-Sutton Pathological Institute, has now the further distinction of an institute of biochemistry, thanks to the gift of $200,000 by Mr. S. A. Courtauld. At the opening ceremony Mr. A. E. Webb-Johnson, honorary treasurer of the medical school, recalled that it was only a few years since Mr. Courtauld gave $100,000 to endow the chair of anatomy, "one of the fundamental medical sciences." The foundations of scientific work in the Middlesex Hospital Medical School were laid by Sir John Bland-Sutton before the war, by his gift of the pathologic institute bearing his name. "Dictionaries printed before the year 1900 contain no such word as biochemistry, but the name is now familiar, and though new, the science is old," said Sir John Bland-Sutton, in an address on "Biochemistry in Relation to Medicine," a science concerned with the application of the principles of chemistry and physiology to the investigation and interpretation of the phenomena of life. He referred to the fact that the kingdoms of nature had been arranged in three classes: mineral, plants and animals. The microscope revealed myriads of minute living things concerning which biologists were puzzled to decide whether they were plants or animals. Such discoveries bridged the gap between the two, and it was now the ambition of biochemists to discover the connecting link between stones and plants, in order to find out how life arose from inorganic matter. He had always maintained that laboratories for investigating disease should be in close association with hospitals. The future of medicine does not lie in prescribing drugs, he declared. The day may come when, some of us believe, the biochemical laboratory may displace the dispensary. Lavoisier, the founder of biochemistry, had his head lopped off in 1794, continued Sir John, by the "apostles of Liberty, Equality and Fraternity," on the excuse that the republic had no need for scientists. Mr. Courtauld had no fear that such a fate awaited him. The wisdom shown in building the laboratory indicated his appreciation of the great part science played in practical medicine. "We may be hopeful," he concluded, "that a discovery will one day be made within the walls of this laboratory which will make the world gape with astonishment." The institute will be a five-floor building, the four upper ones having laboratories for the study of the various branches of biochemistry, all equipped with the latest appliances.

### The Manufacture of Alkyl Resorcinols

After a hearing lasting seventeen days, Mr. Justice Astbury dismissed an action by Messrs. Sharp and Dohme, a corporation organized under the laws of New Jersey, against Boots Pure Drug Company for infringement in relation of their patent for improvements in the manufacture of alkyl resorcinols. The defendants sell a substance described as hexyl resorcinol (Boots), which the plaintiffs alleged was an infringement. The defendants pleaded that, owing to prior publication in chemical papers and treatises, and to prior general knowledge, the alleged patented invention lacked novelty and subject matter, and was therefore invalid. The judge said that the issue was whether, on the true construction of the specification, the alleged patent was valid. If it were valid, the defendants infringed it. That issue depended by reason of anticipation or want of subject matter. The judge examined at great length the various papers and treatises which the defendants referred to as prior publication of the processes. He held that in those papers and treatises were such indications of further results which might be obtained from the processes therein dealt with which robbed the plaintiffs' processes of any invention. Although the bodies produced by the plaintiffs might be new bodies, their production had been indicated by the prior documents. There was no inventive step in the plaintiffs' patent, and he held, therefore, that there was no sufficient subject matter on which the plaintiffs could found their patent. The action was dismissed.

### Scheme for Collective Investigation of Varicose Ulceration and Gastro-Enterostomy

The council of the British Medical Association considers that a scheme of collective investigation organized on an effective basis may be the means of furnishing new data which would assist in the elucidation of many difficult problems. It holds that (1) the inquiries undertaken should be of practical value; (2) the scheme must be voluntary and unpaid; (3) the subject or subjects should be susceptible of being dealt with by replies to direct and definite questions; and (4) the results of the inquiry, in order to sustain interest, should be available after not too long a period. After careful consideration of the subjects which might be investigated in this manner, the council came to the conclusion that varicose ulceration and the after-history of gastro-enterostomy are two subjects on which it would appear desirable to obtain further information. Varicose ulceration is a common experience in medical practice and every physician is frequently called on to treat it. It is accompanied by much pain and discomfort and is responsible for much disability, especially among women. Its treatment is tedious alike to physician and to patient; the results are often disappointing and relapses are

common. Varicose ulceration therefore appears to be peculiarly suitable for a collective investigation by physicians, and the collection and coordination of their experiences would afford a valuable contribution to clinical knowledge. Especially is it desirable to gain information relative to treatment. At present there are many methods and many claims. By a comparison of results it may be hoped that the most successful method will emerge. It is desirable to obtain information as to the after-history of those who have undergone the operation of gastro-enterostomy, and many physicians must be in a position to supply this information. Surgeons regret that in many instances they are unaware of the history of patients after they have left the hospital, and if reliable information of this order could be obtained it would serve to establish the relative value of the short-circuiting operations when performed for ulcerous, cancerous or other conditions of the stomach or duodenum.

### Responsibility for Mosquito Breeding Ground

For the first time it has been decided in court that, if a landowner leaves ditches in a stagnant condition, so that they become a breeding ground for mosquitoes, to the annoyance of local residents, his action or neglect amounts to a nuisance within the public health act. Three ditches close to a residential suburb of Glasgow had become so encumbered with silt and vegetation that they were ineffective as water courses. The water which they should have conveyed had been largely thrown on the adjacent ground. They thus became the breeding ground of mosquitoes which bit people residing in the vicinity. The bites caused pain and swelling, and in some cases septic lesions. The court found that the ditches were a nuisance and injurious to health. The proprietor was therefore ordered to clear the ditches and maintain them properly in the future.

### A Flying Medical Service for the Lonely Outposts of Australia

Physicians each equipped with an airplane are shortly to be introduced in Australia for attending cases in isolated parts of the country. There will be six of these physicians with salaries ranging from $4,000 to $5,000 a year. They will be attached to different bases, where they will await telegraph or wireless calls for aid. No charge will be made for their services. The loneliest stock man will thus be able to summon a physician, who will arrive within a few hours. The service is especially designed to remove the terrors of maternity experienced by women in isolated parts, who hitherto have been cut off from medical aid.

### Rheumatism and Heart Disease

Sir George Newman, principal medical officer to the ministry of health, in a foreword to a report on acute rheumatism in children in its relation to heart disease, just issued, writes: "Practically speaking, every death from heart disease under the age of 40 (save the few due to congenital disease) is due directly to rheumatic infection—all those unfortunate cases of adolescents and of young adults, of fathers and of mothers of young families. The gravity of acute rheumatic fever in children lies in two facts. First, it is a serious illness in itself, which disables the child, and, secondly, it tends to produce permanent injury to the heart, which may terminate life prematurely or produce lifelong invalidity. Only by early, continuous and thorough treatment can we hope to save life or prevent crippling. He points out that during 1926 no fewer than 85,200 deaths occurred attributable to disease of the heart and circulation. If we assume that half the total heart mortality be accounted for by processes of senile decay, it nevertheless means that the other half of this mortality, which falls on childhood, adolescence, young adult life and early middle age, and some of that of later middle age, is due to infective processes such as acute rheumatic fever. Of all patients with cardiac disease in hospitals, the cause is definitely acute rheumatism in approximately 90 per cent of those who are under 10 years of age, in 80 per cent of those between 10 and 20, and in 60 or 70 per cent of those between 20 and 40 years of age. We have no certain knowledge of the causal agent of this infection, although the theory that a streptococcus of the viridans group is the bacteriologic agent, without being fully proved, provisionally holds the field.

## PARIS

*(From Our Regular Correspondent)*

Aug. 3, 1927.

### Septicemia of Dental Origin

Caussade and Glück report a case of dental caries, well tolerated for several years, in which suddenly an ulcerative membranous stomatitis developed with submaxillary adenopathy. While the stomatitis healed rapidly, a septicemia appeared. Blood cultures revealed from the beginning the presence of large numbers of *Bacillus perfringens*, which therefore may be classed, along with streptococci and diplococci, as causative agents of septicemia of dental origin.

### The Rôle of Chance in Cancer Statistics

Auguste Lumière has presented to the Academy of Sciences a critical analysis of statistics pertaining to the hereditary transmission of cancer, the mode of contagion and its peculiar frequency in certain conditions. Viewing the matter from the point of view of pure mathematics, and applying the mode of reckoning by probabilities, he finds that the chances of both husband and wife being affected with cancer are as 1 to 225. Lumière concludes that statistics on cases of this kind are of no value unless they reveal a proportion much higher than 1 to 225, which represents the part played by chance. Likewise with regard to so-called "cancer houses," from one to three deaths from cancer in a given house of a city is no more than would be expected from the calculation of the probabilities. A high degree of conservatism is therefore indicated in dealing with statistics of that kind. Moreover, Lumière, in agreement with Quénu, thinks that the hereditability of cancer, if there is such a thing, is based on a hereditability of the soil, which is subject to modifications due to many changing circumstances, and not on a direct transmission of the virus or a micro-organism.

### The Congress of Medical Alienists

The thirty-first congress of French-speaking alienists and neurologists has just been held at Blois, under the chairmanship of Professor Raviart of Lille. The meetings were held in the historic halls of the Château de Blois in which the Etats généraux convened. In his address, the president, Professor Raviart, protested against public opinion which is inclined to accuse psychiatrists of being all too ready to find persons mentally ill. He said that the proportion of criminally insane and the number of their crimes were increasing in every country of the world. The endeavor to suppress such crimes by temporary imprisonment among ordinary criminals was a poor plan. The culprit was sure to become a recidivist on dismissal from prison. The patient does not receive the proper care, and society is not protected against his acts. Raviart recommends that criminals with reduced accountability be committed to institutions that would not be true prisons nor ordinary hospitals but rather a combination of the two, after the manner of St. Gilles Hospital at Brussels, where there is a laboratory of criminologic research. He advises further the creation of a reeducation center for young criminals under the supervision of medical specialists, adding that five years of agricultural labor will accomplish more in the way of recovery than an equal number of years of

imprisonment. The congress as a whole approved the idea, but the French alienists expressed a preference for a prison in the psychopathic hospital rather than a psychopathic hospital in a prison, so that the whole management might remain in the hands of the physicians.

### The Action of Bismuth Salts on the Spirochete of Yellow Fever

The recognized action of bismuth salts on spirochetes induced Sazerac, Hosaya and Stefanopoulo to test their efficacy on the spirochete of yellow fever. Sodium bismuth tartrate was found to have such a frank preventive and curative action on the spirochete that they thought it was incumbent on them to present a communication on the subject to the Academy of Medicine, thus giving rise to the hope that a specific treatment for yellow fever has been found. The reputation of the scientists who have advanced the idea lends further weight to the hope.

### A Million Francs for Researches on Hebephrenia

M. Maurice de Fleury has announced to the Academy of Medicine that an anonymous philanthropist had commissioned him to place a million francs ($40,000) at its disposal, to be paid in five annual sums of $8,000 each, to support researches on the mental states of young subjects designated today as hebephrenic and schizophrenic, together with delirious states more or less systematized, for which the only remedy that science offers is internment for a long period of years and sometimes for life. The gift will serve to subsidize the laboratories and hospital services in which the researches will be undertaken, 170,000 francs being allocated annually to Paris, and 10,000 francs to three large services in the provinces. If, before the fifth year, the committee substantiates the discovery of a truly preventive or curative treatment of hebephrenic diseases, the 200,000 francs provided for the following year will be bestowed on the discoverer of the mode of treatment. On the committee will serve Dr. Seglas, representing the special services of la Salpêtrière and of Bicêtre, and Dr. Sérieux, representing the psychopathic hospitals of the department of the Seine.

### A National Fund for the Support of Belles-Lettres, Arts and Sciences

M. Herriot, the minister of public instruction, has introduced in the chamber of deputies a bill which provides for the creation of a national fund to be used for the aid of scientists, littérateurs and artists. The fund will be created by the imposition of duties on the production of literary and artistic works that, according to law, fifty years after the death of their authors, revert to the "public domain"; that is to say, may be exploited by any person without paying any royalty to their heirs. By the provisions of the bill, this fifty year term would be extended for a further period of fifty years, the profits to flow into the national fund, which will receive in addition a portion of the fees charged for the issuance of industrial patents, duties on the sale of works of art, and, finally, all fines imposed by the courts by reason of counterfeits. The funds will be used to provide grants for intellectual workers and to encourage artists and scientists to produce works of pure science and art without reference to financial gain, or which would not assure them a living. The distribution of the funds will be made, each year, by a committee appointed by the minister, on which persons distinguished in the various professions concerned will serve.

### A New Museum of Pathologic Anatomy

A new museum of pathologic anatomy has just been established in the Boucicaut Hospital, in which Professor Letulle, who has recently retired from active service, had, with the aid of his preparator M. Normand, created an important study center. The equipment of the museum was provided through the generosity of Dr. Henri de Rotschild and a committee of seventy charter members, who supplied sufficient capital so that the revenue will be adequate to support the enterprise. The museum and laboratory will be accessible to students of all nationalities. There are five distinct services: a museum, a laboratory furnished with the best modern equipment needed for histologic, bacteriologic and experimental research; a library containing at present more than 2,000 volumes; a photographic studio, and quarters for experimental animals. The museum contains about a million microscopic preparations that have been collected from 3,000 necropsies and 5,000 operations; a collection of more than a thousand original photographs in colors, on autochromic plates introduced by Lumière of Lyons, and more than a million drawings pertaining to pathologic histology. The museum was dedicated in the presence of the minister of public instruction and the minister of public health.

### Prenuptial Examinations

The commission on the prophylaxis of venereal disease, at its meeting, July 15, discussed the text of the proposed law pertaining to medical examination before marriage, as submitted by Prof. A. Pinard. The commission gave its unanimous approval of the bill, and congratulated Professor Pinard on his initiative. The commission passed a resolution to the effect that the bill be adopted by parliament, as soon as possible.

## RIO DE JANEIRO

*(From Our Regular Correspondent)*

July 15, 1927.

### Skin Salt Solution Test in Edema

In submitting a report on the McClure-Aldrich salt solution test, Dr. H. Povoa pointed out that nowadays it is no longer the fashion to speak of edema but of edemas, according to the type, the originating and contributory causes, the pathogenic mechanism; renal, cardiac, acute or chronic toxi-infectious, nervous, metabolic, and the like. Different authors have stressed the disappearance of capillary permeability, loss of balance between arterial and venous pressure, hydremia, vasomotor influence of the nervous system, trophic rôle of the motor system and other changes. Povoa studied the value of the McClure-Aldrich skin test in several groups. In eleven normal subjects the resulting wheal disappeared in between forty-five and sixty-five minutes. In five cases of hydropigenous nephritis the test showed a disappearance time of twelve, fourteen, twenty, seven and twelve minutes. The time varied according to the degree of the edema. In ten cases titer changes in the sodium chloride solution or decrease in the dose injected were not followed by any changes in the disappearance time. This test may therefore have some value in dietetics, especially in heart and kidney diseases, when water metabolism must be carefully studied.

### "Meroscopy"

Dr. M. de Abreu reported to the Rio medical society a new method which he calls "meroscopy," for the "fractional auscultation of the heart." A survey of the literature will bring to light the handicaps met by "total" auscultation, because of the quick changes in cardiac phases, especially in cases of irregularity. The "meroscope" aims to conquer these difficulties by a "dissociated" auscultation. The appliance includes a switch, a special stethoscope, an electrical equipment and an oscillometer. The cardiac cycle is divided by the meroscope into two stages: (1) ventricular expression, characterized by opening of the arterial valves, pumping of blood to the arteries and the beginning of ventricular systole (meroscopic advance); (2) ventricular termination, char-

acterized by the opening of the mitral and tricuspid valves and auricular systole (meroscopic regression). The appliance permits the detection of normal and pathologic sounds.

### Brazilian Scientist Awarded a Medal in the United States

The John Scott bronze medal, with a sum of $1,000, will be granted this year to six scientists. One of those thus honored is Dr. Afranio do Amaral, a physician of São Paulo. Dr. Amaral's medal is granted for his process for preparing antivenom serums, including one considered specific against North American poisonous snakes. He has published more than fifty papers on this subject.

## ITALY

*(From Our Regular Correspondent)*

June 30, 1927.

### The Fourth International Congress of Military Medicine

At the Fourth International Congress of Military Medicine in Warsaw, Colonel Caccia presented papers on transport of the wounded in active warfare in a mountainous country and on the results of traumas of the skull and brain and their treatment; Dr. Bernardinis, on the symptomatology of the sequelae of lesions of the skull and brain.

### One Hundred Thousand Children to Be Sent to the Seaside or Mountains

By desire of Premier Mussolini, the number of poor children given free holidays in seaside or mountain colonies this summer will be not less than 100,000. The organization of this welfare work has been affiliated with a national organization of protection of mothers and children, with representatives in all parts of the kingdom.

### Gifts and Legacies to Hospitals

The hospital of Parma has received a legacy of a million and a half lire from Sig. Battista Barbieri, a former patient. The Maggiore hospital of Milan also has received legacies of 1,200,000 lire from various benefactors.

### Prizes for Scientific Work

The Italian medical association of hydrology has offered a prize of 12,000 lire for the best monograph on one of the two following subjects: (1) fango, biology of fango, the optimal temperature for its application; (2) radioactive power of Italian fango from the biologic and therapeutic points of view. The "Luigi Devoto" foundation is offering a prize of 10,000 lire for the solution of a problem of industrial pathology.

### Medicinal Plants of Italy

In a recent meeting of the Italian association for medicinal plants, it was stated that medicinal plants are imported to the value of twenty-five million lire annually, including the most common varieties, such as althea, belladonna, digitalis and camomile. Since many of these plants are produced in large quantities in this country, the president of the assembly, Professor Brizi, asks the physicians, pharmacists and manufacturers of Italy to cooperate in effecting the discontinuance of the importation of plants that are produced in Italy, and also in encouraging the naturalization of exotic medicinal plants.

### Sanitary Regulations with Respect to Industry

The recent general legislation on industrial hygiene contains sanitary regulations applicable both to private industry and to industries managed by the state or other public bodies. The workman must be informed of the dangers of his work, especially if possibilities of asphyxiation or infection exist, and must be instructed regarding means of prevention. Supplies for rendering first aid must be on hand wherever as many as twenty-five persons are employed, and there are special regulations with regard to supplies of medicine and respecting medical examinations in factories where asphyxiating or poisonous substances are handled. The rooms of all factories constructed after this date must be not less than 3 meters in height and must contain for each person at least 10 cubic meters of space and 2 square meters of floor space. The same law limits the weight that may be carried by the arms or on the shoulder: for boys under 15 years old, to 15 Kg.; for boys between 15 and 17, to 25 Kg.; for girls under 15 years old, to 5 Kg.; for girls between 15 and 17, to 15 Kg. The weights that may be transported in two-wheeled carts are defined as follows: on a flat surface eight times the weights given above; on iron rails, twenty times the weights given above; in each case the weight of the vehicle is to be included.

### Results of an Antimalarial Campaign

Professor Peroni of the University of Turin has been asked by the National Veterans' Aid Society to conduct experiments with the preventive and curative immunization against malaria proposed by Professor Cremonese of the University of Rome. The experiments were carried out at Stornara (province of Taranto), in a locality in which the National Veterans' Aid Society is planning to improve 18,000 hectares of land, and lasted a year. Of 113 patients with chronic malaria treated solely by Cremonese's method, 101 (about 90 per cent) did not have any recurrence during the entire year of observation, although they continued to live in an infected district and to work in marshes. During the preceding year, 1,642 days were lost, owing to recurrences of malaria, at a cost to the society of 26,272 lire, whereas during the year of the experiment only seventy-three days were lost, at a cost of 1,168 lire. As to prevention, not one of the twenty-three men who were treated by Cremonese's method contracted malaria, while among 120 who were given prophylactic treatment with quinine and who lived and worked under the same conditions, there were seventy-nine cases of malaria.

## BELGIUM

*(From Our Regular Correspondent)*

July 14, 1927.

### Journées Médicales at Brussels

As always, the journées médicales were a great success; the queen of the Belgians and a number of ambassadors were present at the opening meeting, which was presided over by the minister of the interior. There were meetings of a general nature, addresses and surgical clinics. The festivities included a gala performance at the Monnaie, a reception at the Hôtel de Ville, and excursions to Tournai and Beloeil. Mauriac of Bordeaux, speaking on "The Confines of Medicine," said that a conflict between philosophy and science had long existed. There is a zone which biology should not abdicate; but medicine should not turn away in scorn from philosophy. Literature also affords a frontier in which exchanges have always been made with medicine. Certain physicians have broken bounds and, while continuing the practice of medicine, have enriched literature by works of value.

#### THEORY OF OSSIFICATION

Policard of Lyons discussed the theory of ossification. In trying to understand the growth of bone tissue, one comes, he says, to two conclusions: that it is by no means the product of activity of osteoblasts, and that, far from being a stable tissue, it is continually changing under the influence of the circulation. In this conception of the physiology of bone, ossification is not a result of cellular activity but is a physicochemical phenomenon which is impeded and limited by the action of the cells. Each time that the circulation increases, the cells swell, seeming to erode the bony substance, and this cellular activity is accompanied by decal-

cification. When ossification takes place, the cells, except those of the periphery limiting the phenomenon, are reduced to inactivity.

PRACTICAL APPLICATION OF THE STUDIES ON VASCULAR PERMEABILITY

Dujardin of Brussels spoke on the importance of the study of vascular permeability. The modifications of this permeability are easily studied by investigation of the cerebrospinal fluid. In this way it is easy to find substances which have traversed the vascular tunic. This permeability has been studied, particularly, with three kinds of substances: substances conferring immunity, toxins, and filtrable viruses. Investigations on the index of permeability have been of great service in the diagnosis of general paralysis and the treatment of nervous diseases.

SURGICAL TREATMENT OF ANGINA PECTORIS

Danielopolu of Bucharest believes that insufficient irrigation of the myocardium by the blood is the cause of angina pectoris. He sees a parallelism between the fatigue of a voluntary muscle and that of the myocardium. When a disequilibrium is produced between the work of the myocardium and its irrigation by the blood, there follows an accumulation of toxic products and fatigue of the muscle, whence occur pains and the anginal crises. His deduction is that treatment should aim at preventing the production of the causal reflex. He describes a series of operations having for their purpose the division of the greatest possible number of cardio-aortic sensory fibers and no others.

OCCUPATIONAL DISEASES

Langelez of Belgium discussed the question of compensation in industrial diseases.

ANTHROPOLOGIC PRISON SERVICE

During the excursion to Tournai, Héger Gilbert explained the organization of the medical service in the prisons of Belgium. The activity of this service is of two distinct kinds, that of physical treatment and that of anthropologic study. Only the nine principal prisons have an anthropologic service. The object of this service is the physical and moral study of the prisoners, the investigation by direct and indirect inquiries of their pathologic antecedents, hereditary or acquired, social antecedents, character, tastes, industrial capacities, faults, anomalies, and the motives of their antisocial reactions. The physicians of the anthropologic service, under the direction of their chief, Dr. Vervaeck, have already on file 18,000 case histories.

CARE OF MENTAL INVALIDS

It was at Tournai that the conference with Dr. Héger-Gilbert was held which resulted in the organization, for the first time in Belgium and perhaps in the world, of welfare work for the insane in the asylum itself. It does not limit itself to looking after the material situation of the patient or of his family. The members of the committee judged to be capable of this mission visit personally the insane who are susceptible of being cheered by a visit, conversation, or kind attention on the part of a disinterested person. It is believed at Tournai that this is a means of renewing an interest in life in a large number of these unfortunates still sufficiently lucid to realize where they are and to suffer from the knowledge, and that it is also a means of preparing the convalescent for his discharge and of affording him wise guidance at the time when he renews contact with social life. The work does not consist only in providing entertainment and occupation for the patient, in safeguarding his material interest and in making inquiry previous to his discharge. The committee also takes charge of the matter of reinstating the patient in his family and in society and arranges for medical care, to avoid relapse.

## BERLIN

*(From Our Regular Correspondent)*

July 28, 1927.

### Artificial Immunization Against Tuberculosis

The subject of artificial immunization against tuberculosis was discussed recently at the meeting of the tuberculosis societies at Salzbrunn and also at the session of the Deutsche Vereinigung für Mikrobiologie in Vienna. At Salzbrunn, Professor Uhlenhuth of Freiburg presented his opinions based on his attempts to immunize calves with mildly virulent bacilli of bovine tuberculosis, which had been cultivated through many generations over a period of twenty-five years. He believes that the question of artificial immunization against tuberculosis has not yet been solved in a practical way. The experiments of Selter, Möller, Böhme and others, who have attempted to immunize infants as well as cattle by inoculating them with attenuated virulent tubercle bacilli, do not appear to him to justify the use of the method in general practice, since experiments on infants are, at the present stage of progress, too dangerous. Also Calmette's inoculation experiments with BCG vaccine were subjected to extensive criticism.

Uhlenhuth holds that the results of inoculations of cattle and of infants, which have been carried out on a large scale in France and other countries, are in urgent need of confirmation, with the employment of the necessary controls, and, especially, the reputed harmlessness of such inoculations needs investigation. Likewise, Vilbert's experiments with monkeys should be confirmed. With killed tubercle bacilli and acid-fast bacilli, Uhlenhuth was able to produce only a temporary increase of resistance, which was not comparable with the immunity effected by living tubercle bacilli. The tuberculin reaction is not a criterion for an existing immunity, especially following treatment with killed tubercle bacilli. In closing, Uhlenhuth recommended that confirmatory tests be applied to the various newer immunization procedures, particularly that of Calmette, in comparison with other living and killed bacilli, and in connection with corresponding natural conditions of infection. It will be an interesting revelation if it proves to be true that the practically avirulent culture of Calmette is greatly superior, in its immunizing effect, to the more virulent cultures. He is willing to leave to the clinician the decision as to the admissibility and the relative danger of protective inoculations applied to infants.

From the standpoint of the pediatrician, Bessau of Leipzig expressed himself as opposed, because of the danger, to protective inoculations with living attenuated but still virulent cultures (Selter, Möller). With reference to Friedmann's turtle tubercle bacilli, he thinks that confirmation of the experiments on monkeys carried out in the Stellingen zoological garden is needed; the Friedmann vaccine is no doubt harmless, but biologically it is not sufficiently effective. The results of the Calmette inoculations appear promising, but they may not be as favorable as might to supposed from the accounts to be found in French medical journals. He mentioned, in this connection, the fact that Calmette fails to give sufficient comparative statistics and necropsy observations with regard to children dying subsequent to inoculation. Immunization trials with dead bacilli are, in the nature of the case, harmless, but as to their immunizing effect on man, no final judgment can as yet be formed, as the statistical material is still inadequate. Bessau thinks that inoculations with killed bacilli point to the right method and that by refinements in the preparation of the vaccine the results may be still further improved. As a preliminary research, preparing the way for more comprehensive immunization experiments on children, he recommended more extensive statistics on the tuberculosis mortality of children of preschool age

when living in an exposed environment and also comparative statistics on attempts at immunization with the various vaccines as applied to monkeys.

Selter of Bonn confirmed the observations of R. Kraus and others to the effect that the Calmette vaccines are not practically avirulent, as has been asserted, but give rise to a tuberculous condition in guinea-pigs, and that the immunity produced in treated animals is the result of the tuberculous infection. The evidence submitted by Calmette to establish the value of the protective treatment of infants Selter refuses to accept as valid, since all the children so treated were receiving special care when they were inoculated, which fact in itself would explain, at least in part, the favorable effects on the mortality rate. The absence of tuberculin sensibility in children receiving protective treatment through the intestine would also indicate that the children were not immunized.

Seiffert of Munich reported on experiments with a vaccine from tubercle bacilli in which the acid-fastness had been nullified by a conservative method (extraction with acetone, saponification with solution of caustic soda at a low temperature in a vacuum).

Langer of Berlin was able, by means of his vaccine consisting of killed tubercle bacilli, to produce in children, constantly, a condition of altered susceptibility to tuberculosis (tuberculosis allergy). As a result of inoculations on 180 monkeys in the Berlin zoological garden, the tuberculosis mortality over a period of one year was reduced from 20 per cent to 8 per cent.

Szalai of Pesterzsebet (near Budapest) reported on the results from 10,000 inoculations of tuberculous patients with the Friedmann remedy. He contended that, in a city of 50,000 inhabitants, by means of such inoculations the tuberculosis mortality had been reduced from 36 per 10,000 inhabitants, in 1922, to 23.7, in 1926.

Bruno Lange of Berlin does not think that the Langer method constitutes an advance. He opposes likewise the Salter method of immunization with living tubercle bacilli, somewhat attenuated in virulence, since not only the numerous experiments on animals but also the inoculations of children had been carried out without exact knowledge of the virulence and the quantity relations of the inoculated tuberculosis cultures. Of the BCG vaccine he had observed that large quantities are well borne by guinea-pigs and rabbits. There develops a mild type of tuberculosis, which does not become generalized and which, after a short time, is healed. Experiments did not show any increased virulence of the culture as a result of passage through animals.

Neufeld of Berlin opposed energetically the statements of Wertheim of Berlin, who accepts as established the specificity of the Friedmann bacilli and their capacity to produce tuberculin allergy. Neufeld does not regard killed bacilli as entirely ineffective, but holds that they have only a weak immunizing action. That also living bacilli may produce a strong immunity is evident from recent researches on pneumococci. There is, therefore, *a priori*, a possibility that living tubercle bacilli may produce a strong immunity. He, also, advocates an investigation and confirmation of the Calmette claims.

Georg Wolff of Berlin took exception to the statistical statements of Szalai, and emphasized that, in other countries, for example, in Germany, during the stated period 1922-1926, tuberculosis mortality, without Friedmann inoculations, had declined considerably more than in Pesterzsebet.

Brauer of Hamburg expressed himself as skeptical of the scientific value of the inoculations of monkeys with the Friedmann remedy in the Stellingen zoological garden, as there was a wide difference in the incidence of tuberculosis among the various groups of monkeys brought from their native habitat.

Bräuning of Stettin stated that he had received information from the veterinarian of the Stellingen zoological garden to the effect that of thirty-eight baboons inoculated with the Friedmann remedy in June, 1926, up to December, 1926, thirty-two had died from tuberculosis after one, and, in some instances, two inoculations against tuberculosis.

At the Vienna meeting of the Vereinigung für Mikrobiologie, Professor Kolle of Frankfort-on-the-Main expressed essentially the same views in regard to the value of the Calmette method of immunization that were expressed by Uhlenhuth and others. While giving full recognition to the great theoretical and practical importance of the Calmette procedure, Kolle hesitated to pronounce any final judgment, since in animal experimentation no absolute immunity is attained, and relapses in the form of a return of virulence are possible. In veterinary medicine the method may be very important, but before it can be applied to man it should be subjected to a thorough test. In his comprehensive paper on active immunization and protective inoculation, Kolle gave a critical survey of the various methods of protective inoculation from the standpoint of their practical results, in which he called attention to the difficulties that lie in the way of an exact judgment of the value of a given method of inoculation. Protective inoculation with killed causative agents was illustrated by comparison with inoculation against typhoid and cholera. Although the method of inoculating against typhoid is by no means ideal, the results are not bad either from the standpoint of the total statistical outcome or from the point of view of the individual behavior of the persons inoculated. In addition to the antibodies, certain changes that the cells undergo play a part in the establishment of immunity. The speaker discussed the older and the more recent (Besredka) attempts to introduce oral immunization, but rejected the assumption of a specific local immunity. The antivirus method of Besredka with culture filtrates of streptococci and staphylococci cannot be finally judged on the basis of the experimental and practical material that has been supplied. Immunization with living causative agents (smallpox, pleuropneumonia, swine erysipelas, rabies, diphtheria) is in many cases dangerous, on account of the wide range of susceptibility in various individuals, even when the action of the vaccine has been attenuated by special methods. Kolle suggests that, first, a fundamental immunity be induced with the killed causative agent, and that then a full virus be employed to complete the immunization.

## Marriages

ALPHONSE RALPH VONDERAHE, St. Bernard, Ohio, to Miss Ida Elizabeth Koch of Walnut Hills, August 10.

CARL MILO RYLANDER, Altona, Ill., to Miss Melna C. Meyers of St. Louis, at Jerseyville, Ill., July 23.

EUGENE GILLIS STEELE, Plentywood, Mont., to Miss Maud C. Woods of Los Angeles, June 15.

KARL ROTHSCHILD to Miss Lillian B. Schwartz, both of New Brunswick, N. J., June 12.

IVAN GILBERT to Miss Opal Bell Allen, both of Terre Haute, Ind., at Sullivan, August 16.

BERNARD WEBER, Olney, Ill., to Miss Louise Ghanoweth of Taneytown, Md., July 1.

RALPH D. BERGEN, Rochester, Minn., to Miss Elizabeth Goggins, August 2.

WILFORD C. WOOD to Miss Dorothy Donovan, both of Detroit, recently.

RALPH J. PANTZER, Indianapolis, to Miss Edith Taggart of Paoli, June 25.

IRVING I. CROUSE to Miss Leya Greenberg, both of Buffalo, June 28.

# Deaths

**Harry Edwin Lewis** ✠ New York; University of Vermont College of Medicine, Burlington, 1897; member of the American College of Physicians; formerly on the staffs of the Fanny Allen Hospital, Winooski, Vt., the Providence Hospital and Orphan Asylum, Providence, R. I., the Harlem Hospital and the New York Throat, Nose and Lung Hospital, New York; secretary of the Vermont State Tuberculosis Commission, 1902-1904; chairman of the American Delegation to the British Congress of Tuberculosis at London, 1901; editor of *American Medicine* since 1908; aged 52; died, August 6, following a long illness.

**Ignatz Morvay Rottenberg,** New York; University of Budapest, Hungary, 1881; member of the American College of Physicians, and the Medical Society of the State of New York; formerly commissioner of lunacy of the state of New York; founder of the People's Hospital and St. Mark's Hospital, of which medical boards he was president and secretary, respectively; aged 70; died, August 9, of carcinoma of the stomach.

**Ferdinand Frederick Hedemann,** Honolulu, Hawaii; Harvard University Medical School, Boston, 1903; Columbia University College of Physicians and Surgeons, New York, 1907; member of the Hawaii Territorial Medical Association; served during the World War; visiting pediatrist to the Kauikoolaui Children's Hospital and the Queen's Hospital, where he died, July 26, of uremia, aged 48.

**Edward Boeckmann,** St. Paul; University of Oslo, Norway, 1874; member of the Minnesota State Medical Association; formerly professor of ophthalmology, Minneapolis College of Physicians and Surgeons; past president of the Minnesota State Board of Health; veteran of the Spanish-American War; formerly on the staff of the St. Paul Hospital; aged 78; died, August 8, of heart disease.

**Frederic Oakman Virgin,** New York; Columbia University College of Physicians and Surgeons, New York, 1899; member of the Medical Society of New York; on the staffs of the Harlem Eye and Ear Hospital, the Sloane Hospital for Women and the Community and St. Luke's hospitals; aged 54; died, August 3, at West Harwick, Mass., of angina pectoris.

**Hosea Mason Quinby,** Worcester, Mass.; Harvard University Medical School, Boston, 1868; member of the Massachusetts Medical Society, the American Psychiatric Association and the New England Society of Psychiatry; for many years superintendent of the Worcester State Hospital; aged 87; died, August 13, at the Memorial Hospital.

**S. W. Moorhead,** Keokuk, Iowa; College of Physicians and Surgeons, Keokuk, 1883; in 1884 was appointed to the chair of materia medica and therapeutics at his alma mater; Civil War veteran; formerly mayor and postmaster of Keokuk; aged 78; died, August 11, at the W. C. Graham Protestant Hospital, of cerebral hemorrhage.

**Hubert Haywood,** Raleigh, N. C.; Bellevue Hospital Medical College, 1879; member of the Medical Society of the State of North Carolina; for thirty years physician to the North Carolina State School for the Blind and Deaf; aged 72; died, August 9, at a hospital in Richmond, Va., of uremia and hypostatic pneumonia.

**Christian Neufarth,** Sunman, Ind.; Medical College of Ohio, Cincinnati, 1883; member of the Indiana State Medical Association; president Farmers' State Bank; aged 68; died, August 12, at the Decatur County Memorial Hospital, Greensburg, of injuries received in an automobile accident.

**Andrew Jackson Hedgcock** ✠ Decatur, Ill.; Northwestern University Medical School, Chicago, 1915; served during the World War; on the staff of the Decatur and Macon County Hospital; aged 40; died, August 16, at Rochester, Minn., following an operation for gallstones.

**Samuel Brown Thomas** ✠ Waynesboro, Pa.; Jefferson Medical College of Philadelphia, 1911; on the staff of the Waynesboro Hospital; aged 41; died, August 5, at the Union Memorial Hospital, Baltimore, of pneumonia, following an operation for gallstones.

**Wilford E. Senour,** Bellevue, Ky.; University of Louisville School of Medicine, 1891; member of the Kentucky State Medical Association; on the staff of the Speer's Memorial Hospital, Dayton; aged 60; died, August 13, of cerebral hemorrhage.

**Victor Hugo Stickney** ✠ Dickinson, N. D.; Dartmouth Medical School, Hanover, N. H., 1883; past president of the North Dakota State Medical Association; formerly on the staff of St. Joseph's Hospital; aged 72; died, July 26, of carcinoma.

**Joseph Monroe Richmond** ✠ El Paso, Texas; Marion-Sims College of Medicine, St. Louis, 1892; formerly on the staff of the El Paso Masonic Hospital; aged 59; died, August 8, at a local hospital, of injuries received in an automobile accident.

**William Bartholomew Thompson,** Brooklyn; M.R.C.S., England, and L.R.C.P., London, 1892; Queen's University Faculty of Medicine, Kingston, Ont., Canada, 1892; aged 62; died, July 28, at Center Moriches, N. Y., of peritonitis.

**George E. Flowers,** Hickory, N. C. (licensed, by the North Carolina State Board of Medical Examiners, year unknown); member of the Medical Society of the State of North Carolina; aged 70; died suddenly, August 6, of heart disease.

**Cecil Browning Ray** ✠ Barnwell, S. C.; Medical College of the State of South Carolina, Charleston, 1912; served in France, during the World War; aged 38; died, August 5, at a hospital in Columbia.

**Ward Fremont Sprenkel,** Philadelphia; University of Pennsylvania School of Medicine, Philadelphia, 1894; aged 57; died, June 16, at the Memorial Hospital, New York, of carcinoma of the bladder.

**Louis Simon Blumberg,** Newark, N. J.; Baltimore Medical College, 1907; served during the World War; formerly on the staff of the Beth Israel Hospital; aged 47; died, July 16, at the City Hospital.

**C. Othello Moore,** New Albany, Ind.; University of Louisville (Ky.) School of Medicine, 1888; aged 60; died, recently, at Sts. Mary and Elizabeth Hospital, Louisville, of appendicitis.

**Michael Francis Phelan,** Troy, N. Y.; Albany Medical College, 1891; aged 57; died suddenly, August 4, of heart disease, on board the steamer *Rensselaer* while en route to his home.

**Joseph Alfred Lewis Wolfe** ✠ Sherman, Texas; University College of Medicine, Richmond, 1912; on the staff of St. Vincent's Sanitarium, where he died, August 10, of heart disease, aged 39.

**Virgil Allen Voyles,** Gotebo, Okla.; Louisville (Ky.) Medical College, 1894; aged 71; died, July 19, following an operation on the gallbladder, performed about two months ago.

**William Albert Lisman,** Carlisle, Ind.; Rush Medical College, Chicago, 1880; member of the Indiana State Medical Association; aged 76; died, July 27, of chronic endocarditis.

**Lawrence John Davis** ✠ Carnegie, Pa.; Medico-Chirurgical College of Philadelphia, 1912; aged 41; died, August 8, at the Allegheny General Hospital, Pittsburgh, of diabetes mellitus.

**Henry Thomas Bracken,** Miami, Fla.; University of Nashville (Tenn.) Medical Department, 1873; Civil War veteran; aged 80; died, May 30, of uremia and chronic nephritis.

**Maurice Fitzgerald,** El Reno, Okla. (licensed, by the Oklahoma State Board of Health, under the Act of 1908); aged 82; died suddenly, July 26, of cerebral hemorrhage.

**Thomas C. Thompson** ✠ Vidalia, Ga.; University of Georgia Medical Department, Augusta, 1908; medical director of the Vidalia Hospital, where he died, July 25, aged 41.

**William Louis Hartman,** New York; Columbia University College of Physicians and Surgeons, New York, 1901; aged 53; died, August 6, of chronic heart disease.

**Horace Green Webber,** Wilbraham, Mass.; Medical Department of the University of the City of New York, 1880; aged 72; died, July 20, of heart disease.

**William H. Greis,** Syracuse, N. Y.; University of Vermont College of Medicine, Burlington, 1891; aged 62; died suddenly, August 7, of heart disease.

**Edgar Henry McCurdy,** North Scituate, R. I.; Rush Medical College, Chicago, 1905; aged 56; died, August 16, at Wolfville, N. S., Canada, of heart disease.

**Forest Hallie Rogers** ✠ Waterbury, Conn.; Yale University School of Medicine, New Haven, 1923; aged 27; died, August 12, of a streptococcic infection.

**Fielding P. Stapleton** ✠ Lawrence, Kan.; Marion-Sims College of Medicine, St. Louis, 1892; aged 59; died, July 20, of carcinoma of the rectum.

**Dales Young Graham,** Morning Sun, Iowa; Rush Medical College, Chicago, 1890; aged 61; died, August 3, of angina pectoris.

**Berry A. Royall,** Villa Ridge, Ill. (licensed, Illinois, 1878); aged 78; died, July 30, at Hickman, Ky., of arteriosclerosis.

# The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE JOURNAL'S BUREAU OF INVESTIGATION, OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER GENERAL MATERIAL OF AN INFORMATIVE NATURE

## PHOSPHOBION NOT ACCEPTABLE FOR N. N. R.

### Report of the Council on Pharmacy and Chemistry

The Council has authorized publication of the following report. W. A. PUCKNER, Secretary.

Phosphobion, manufactured by Dr. Theodor Koenig, Munich, Germany (Carl F. Lauber, Philadelphia, distributor), are pills, each stated to contain zinc phosphide, 0.0025 Gm., and iron glycerophosphate, 0.03 Gm. The pills are stated to be coated with graphite and keratin. This coating is claimed to prevent their disintegration in the stomach. No evidence is offered to show that the zinc phosphide content of the finished pills is controlled or that the coating actually prevents their disintegration by the gastric juice.

Phosphobion, according to the advertising, represents a new treatment for sleeplessness discovered by Dr. Rudolph Heinrich, who is described as "the well known Munich nerve-specialist." According to Dr. Heinrich, it is stated in the advertising,

"The most frequent form of insomnia is a nervous condition, having the causes in a more or less acute disturbance of the recreative activity of the brain, particularly in the reproduction of the phosphorus, for the organism seems sometimes to use up more phosphorus than it can replace."

It is explained:

"Dr. Heinrich has tried to counteract the disturbed activity of the nerve-cells, by prescribing active, unoxidized phosphorus, a treatment followed by unprecedented results."

"The difficulty was to get active unoxidized phosphorus in the body. After long and careful experiments, in which he was assisted by Dr. Theodor Koenig of Munich, Dr. Heinrich has succeeded in producing Phosphobion, a medicine which has all the properties of pure phosphorus."

"Phosphobion is the only means of obtaining normal sleep, because it removes the cause of insomnia without in any way damaging the organism."

The well known zinc phosphide was chosen as the means of getting "active unoxidized phosphorus into the body." The theory is advanced that the phosphorus of the zinc phosphide at the moment of its liberation from the zinc ("status nascendi") acts like elementary phosphorus and exerts the effects of elementary phosphorus. It is also claimed that the glycerophosphoric acid of the iron glycerophosphate favors through catalytic action the formation of lecithin from elementary phosphorus. Thus it is seen that the asserted action of "Phosphobion" is based on the pyramiding of unproved hypotheses: (1) that insomnia is due to a phosphorus deficiency in the nervous system, (2) that phosphorus medicinally administered is capable of remedying such phosphorus deficiency, (3) that zinc phosphide acts like phosphorus, and (4) that the iron glycerophosphate addition favors the formation of lecithin from elementary phosphorus. No data are submitted in favor of these theories.

There is of course the possibility that a substance may have a certain therapeutic action, even though the theory on which this action is assumed is utterly fallacious. The evidence for the claimed efficiency of "Phosphobion," however, is not convincingly in favor of the asserted action. In a trial made for the Council, Phosphobion was used without effect in two cases of insomnia of neurasthenia; this shows that the drug is not uniformly efficacious.

According to the letter of the German manufacturer which the American agent sent to the Council, a circular on "Sleeplessness" giving instructions for the use of Phosphobion accompanies the trade package. Thus the product is advertised indirectly to the public.

The Council found Phosphobion unacceptable for New and Nonofficial Remedies because it is an unscientific mixture of drugs marketed under a nondescriptive name with claims that are not supported by acceptable evidence and in a way to lead to its ill advised use by the laity.

# Correspondence

## CANCER MORBIDITY

*To the Editor:*—In outlining the cancer program of the Massachusetts Department of Public Health, the need for cancer morbidity statistics was at once apparent. While mortality figures and hospital records for this disease are available and have been freely studied, little is known regarding cancer morbidity in the community at large. Those who die of cancer can be enumerated, but the numbers who recover from this disease are largely estimated. In an effort to determine the extent of the disease in Massachusetts, various mathematical compilations were made; but these are all theoretical and may not even approximate the truth (Cancer in Massachusetts, *Boston M. & S. J.* **194**:388 [March 4] 1926).

To offset this lack of knowledge, it has been suggested that cancer be made a reportable disease. In Massachusetts, at least, this would be a distinct innovation, since at present all reportable diseases are communicable. As this list numbers thirty-eight, one should think well before making it more formidable. Again, much complaint is heard regarding the inadequacy of present reporting. This would hardly be reduced by further burdening the physicians, particularly with a disease the reports of which would be used primarily for statistical purposes. One factor in the accuracy and adequacy of reporting is the concreteness of the clinical entity; the less defined, the more inadequate. This is one reason why our measles morbidity is probably more accurate than our influenza morbidity, for example. Thus, if universal cancer reporting were at all accurate, it would in general be so late as to be little more than a brief anticipation of the death returns; or, if early and unless adequate diagnostic resources were liberally available and liberally used, it would be little more than a recording of early cancer symptoms. Neither of these conditions would advance appreciably our knowledge of the incidence of the disease or of the proportion of cured cases. Thus, we have opposed general reporting of cancer for the present.

CANCER MORBIDITY REPORT FORM

Name Sex Age
Address
Civil condition
Type of disease
Location of disease
Date of first symptom
Character of first symptom: Pain, Lump, Abnormal discharge
Date of first consulting physician
Has any member of patient's family had cancer
Relationship
Has patient ever been in close association with a cancer patient
Injury at site of cancer
Operation for cancer—what
Operation other than for cancer—what
Does patient use alcohol
Does patient smoke (pipe, cigar, cigarette)—chew
Does patient have periodic craving for unusual articles of food
What
Does patient eat little or much salt
What foods does patient never eat
Is patient constipated
Has patient suffered from chronic disease What How long
Interval between first symptoms and treatment X-ray Radium
Housing Economic status
No. of physicians consulted No. of irregular practitioners consulted.
Possible precancerous condition at site of disease. Mole, wart leukoplakia, ulcer, uterine tear, chronic irritation from teeth, from corsets, other known chronic irritation.

.....
Physician's signature

.....
Address

.....
Telephone number

However, when the physicians of a given community are willing to report voluntarily in an effort to determine the practicability and value of such a procedure, it is quite another matter. This has happened in Newton. The whole matter was presented to the Newton Medical Club last fall, and the value of an experimental morbidity reporting area to the studies of cancer being conducted by the state department of public health was outlined. It was voted to report cancer cases to the local board of health, and the president of the club was authorized to appoint a committee to direct this work, of which the chairman of the board was made chairman. Another committee was appointed to organize a cancer clinic in the Newton Hospital in order that diagnostic and treatment facilities might be more generally available. This has been done. The foregoing report form was adopted.

In the first seven months of morbidity reporting, thirty cancer cases in residents and twelve cases in nonresidents were reported to the local board of health. During this period there were twenty-nine deaths from cancer among residents, of whom only five had been reported, a ratio of one to six. If the same ratio applies to the cancer cases as to the cancer deaths there were in Newton during this period about 175 cases. This figure is fairly close to the one obtained when an attempt was made to estimate the number of living patients from the cancer mortality records.

It is realized that the response of the Newton physicians has not been as complete as might be desired, but the present indications point to an improvement in this respect. As Newton is the first city in the United States to report its cancer cases, this statement seems advisable as it indicates a method which might be used in other selected communities to add materially to our knowledge of this pressing problem. Also appreciation should be expressed of the fact that busy practitioners of a community are willing to take on this added obligation.

FRANCIS GEORGE CURTIS, M.D., Newton, Mass.
GEORGE H. BIGELOW, M.D., Boston.

## Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

### "CEANOTHYN"

*To the Editor:*—Will you kindly give me the pharmacologic action and toxicology of *Ceanothus americanus?* For the past six months I have been using "Ceanothyn," a product of Flint-Eaton & Company, rather extensively in my nose and throat practice. I have not only used it to stop hemorrhage, but also have used it as a routine before tonsillectomies and intranasal operations as a prophylactic measure. Recently a sudden death occurred in a man, aged 37, who was scheduled for a tonsillectomy. Twenty-four hours before his death he had taken castor oil and on the day prior three doses of sodium bicarbonate, 1 drachm in water, morning, noon and night. The night prior to the death he had taken one tablespoonful of Ceanothyn and then again on the morning of the death he had taken another about one hour before he suddenly dropped dead. No other drugs were taken. At postmortem, brain, heart and all organs were normal in appearance and nothing organically abnormal was found with the exception of a moderate congestion of the kidneys, gastric mucosa and lungs. This congestion was not sufficient to cause death. However, it was thought that the toxic agent which had caused the congestion might possibly have been the cause of death. Could there be any change in toxicity of Ceanothyn by reason of the soda being taken with it? Kindly omit name.

M.D., Ohio.

ANSWER.—Ceanothyn is said to be a hydro-alcoholic extract of *Ceanothus americanus,* each cubic centimeter of which contains 1 mg. of the mixed alkaloids of *Ceanothus americanus.* The manufacturers state: "The results of extensive investigation conducted up to the present indicate that Ceanothyn is a valuable, standardized haemostatic and uniform in action."

There have been few studies of the chemistry of *Ceanothus americanus,* New Jersey tea, or red root, as it is variously called, but the literature has been reviewed in a report of the Council on Pharmacy and Chemistry (THE JOURNAL, March 20, 1926, p. 890). That report contains the following statement: "But neither these studies nor the investigation carried out for Flint, Eaton & Company, after the mixed alkaloids had been 'isolated' by the firm's chemist, accomplished the isolation of a pure product. On the contrary, the investigation made for the firm indicates that the alkaloidal yield is variable and that it is difficult or impossible to prepare the alkaloid or alkaloids in a pure state. No evidence is available to warrant the claim that the uniform action of 'Ceanothyn' is insured by the 'standardization.'"

Since the report of the Council was prepared, three papers have appeared. The first of these is by A. H. Clark (*Am. J. Pharm.* **98**:147, 1926), who states that Ceanothus contains a complex mixture of alkaloids; the second is by Guy C. Taylor from the Laboratory of Flint, Eaton & Company (*Am. J. Pharm.* **99**:214, 1927) and has little bearing on the present question. The third is by James T. Groot (*J. Pharmacol. & Exper. Therap.* **30**:275 [Feb.] 1927), who studied its influence on the coagulation time of blood and the effects of a hydro-alcoholic extract of the bark and those of the amorphous mixture of alkaloids. Groot reported that the intravenous injection of this mixture in dogs always caused a marked fall in blood pressure. The heart rate remained exactly the same in four of the six experiments and without any essential change in the other two, although the dose of alkaloids injected varied from 3 to 60 mg. Curiously, there was no change in amplitude of the pulse tracing in three of the experiments. The amplitude increased by about 20 per cent in two and it decreased by about 12 per cent in one, the fall of blood pressure being therefore entirely independent of the heart rate and the amplitude. The results of these experiments confirm the statement made in the Council report for they show that the effects on blood pressure are extremely variable. A dose of 3 mg. caused the blood pressure to fall to about 70 per cent of the previous level. If these wholly anomalous results are attributable to the effects of the alkaloids alone, it is obvious that no one can foresee what the effect of any dose will be. It is assumed that the alkaloids cause vasodilatation, but there is no direct evidence concerning its mode of action. It is impossible therefore to explain the cause of death reported by our correspondent; but it is obvious that the physician should exercise caution in using a drug about the mode of action of which on the circulation practically nothing is known except that small doses may cause a profound fall of blood pressure whereas much larger doses may produce little effect, for no one can foresee when an accident will result from a profound fall of blood pressure in the various diseases involving the circulatory system.

### BLEACHING OF FLOUR

*To the Editor:*—In the London Letter (THE JOURNAL, June 11, p. 1915) reference is made to the suggested prohibition of chlorine, nitrogen trichloride and benzoyl peroxide as flour bleachers. Which substances are those most acceptable as bleachers or "improvers"? and how are they used? In addition to the electrical method is there any other in favor with health authorities?

MIGUEL JIMÉNEZ, Zamora, Mexico.

ANSWER.—The reagents commonly used by millers for "bleaching," "ageing" or "improving" flour are:

1. Nitrogen peroxide, generated by an electric discharge.
2. Chlorine, usually containing a very small amount of nitrosyl chloride.
3. Nitrogen trichloride.
4. Organic peroxides, among which benzoyl peroxide has the most extensive use.

All of these reagents when used for treating flour have been patented and are sold under designated trade names. For example, the trade name "Agene" refers to a patented process for the application of nitrogen trichloride in treating flour.

The method of using these reagents varies with their physical characteristics. If the bleaching agent is a gas such as chlorine, nitrogen peroxide or nitrogen trichloride, it is diluted by a large volume of air and blows into the agitators where the flour is treated. There are various methods and mechanical devices which are used for this purpose.

If the reagent is solid like benzoyl peroxide and its admixtures, the reagent must be thoroughly mixed with the flour. This is accomplished by mechanical mixing methods of various kinds with the object of obtaining a uniform distribution of the reagent through the flour.

There is a rather considerable old literature on the physiologic effects of "bleached" flour mainly in relation to digestion

and enzyme activity. Recent work on the subject is not extensive and the problem from the standpoint of the public health still requires review and thorough study by competent authorities. The report of the British Ministry of Health referred to in the London letter, July 11, is the latest attempt to clarify the flour treatment problem, on the basis of existing knowledge. There is little in the report making for definite clarification of the public health aspects of the problem and there is apparently little disagreement here with the United States Department of Agriculture, which requires that all bleached flour shall be so labeled by the manufacturer.

Recently investigators have become interested in the improvement of the baking qualities of flour by heat treatment in which no reagents are used, leading to claims that an improvement process of this kind may have future significance if satisfactory results can be accomplished without the use of chemicals.

While the German government recognizes the treatment of flour with chlorine and nitrosyl peroxide, and also benzoyl peroxide, the health authorities of several European nations have the flour bleaching problem under investigation with reference to future action.

As in many other public health problems, considerable more work will have to be done before the physiologic effects of bleached flour and its products are thoroughly understood. It is quite probable that the time has now come for an intensive study of these problems. At present the controversy is somewhat acrid between extremists on both sides, and sad to relate, it has its traditions and its feuds of long standing.

What is needed now is obvious: intensive research on all aspects of the problem by our most competent physiologists, biochemists, medical authorities and public health authorities, that is, if they are interested.

## EMBALMING

*To the Editor:*—Please give me the best formula for embalming and the manner by which it is done. Is there any truth in the statement that to open up the heart and pump the embalming liquid to that point will produce the best way of sending it to all parts of the body? Please omit my name.

M.D., Philippine Islands.

ANSWER.—The best formula for embalming will depend on the purpose for which the embalming is done. If it is desired to prepare material for dissection, one of the best formulas for embalming is alcohol, glycerin and phenol (carbolic acid), equal parts. If it is desired to harden the parts of the body, thus preserving their shapes and relationships, a good embalming fluid is "solution of formaldehyde," 1:4. Many other fluids may be used for particular purposes. In any case the fluid is best introduced by a T cannula; that is, a three way cannula. This is inserted into the femoral artery by preference and it can be inserted more neatly if the fluid is introduced through the stem of the cannula and if the two arms are of unequal length. The femoral artery is a much better site for injection of human subjects than the heart.

## INJECTIONS OF OXYGEN—TREATMENT OF PARKINSON'S DISEASE

*To the Editor:*—1. Have the intravenous or intramuscular injections of oxygen any therapeutic value, especially in anemias? Is there any clinic where this method is used? 2. How is bulbocapnine used in the treatment of paralysis agitans?

FAUSTO ROBLETO, M.D., New York.

ANSWER.—Concerning the subcutaneous and intravenous injection of oxygen in asphyxial conditions, Torald Sollmann in "A Manual of Pharmacology," third edition, W. B. Saunders Company, 1926, page 772, writes as follows:

Subcutaneous Injection of Oxygen.—This was introduced by Derose, 1912. McCrae, 1914, believes that it has a limited field as a substitute for inhalation.

Yandell Henderson, 1918, states that life may be maintained by intraperitoneal injection of oxygen.

Intravenous Injection of Oxygen.—This is described by Tunnicliff and Stebbing, 1916. It gives rapid relief to the cyanosis and dyspnea. In man, the gas can be injected into a vein at the rate of 600 to 1,200 cc. per hour, usually beginning with the rate of 500. The heart must be watched, the injection being stopped if any irregularity appears.

Comment on the use of oxygen in the anemias, in the same work, page 771, is as follows:

In anemia (whether from hemorrhage or any other cause, such as chlorosis or leukemia) asphyxial conditions result, not from deficient supply of oxygen, but from a deficiency of hemoglobin. The inhalation of oxygen, in these cases, does not increase the quantity of oxygen carried by the hemoglobin, but that carried in solution by the plasma.

The following additional references may be of interest:

Howitt, H. O.: Subcutaneous Injection of Oxygen, *Canad. M. A. J.* **4**: 949 (Nov.) 1914; abstr. THE JOURNAL, Nov. 28, 1914, p. 1981.

Torraca, L.: Intravenous Injections of Oxygen in Animals: *Riforma med.* **38**: 985 (Oct. 16) 1922; abstr. THE JOURNAL, Dec. 30, 1922, p. 2256.

Martinet, A., and Heckel, F.: Subcutaneous Injection of Oxygen in Treatment of Permanently Weak Pulse, *Presse méd.*, March 26, 1913, p. 241; abstr. THE JOURNAL, May 3, 1913, p. 1401.

For material on the use of bulbocapnine in paralysis agitans, consult:

DeJong, H., and Herman, W.: The Action of Bulbocapnine in Three Cases of Paralysis Agitans and One Case of Tremor of Paralysis Agitans Type, *Arch. Neurol & Psychiat.* **16**: 55 (July) 1926.

## LYMPHATICS OF THE PLEURA

*To the Editor:*—Do the tributaries of the external jugular vein group of lymphatic glands drain the region of the apical part of the parietal pleura, or is it possible that this group of lymphatic glands becomes tuberculous, infected by way of their afferent lymph vessels in draining the upper part of the apical parietal pleura, which might be infected with tuberculosis?

M.D., Denver.

ANSWER.—The superficial cervical lymph glands situated along the course of the external jugular vein do not receive afferent vessels from the cupula pleurae. Afferent vessels from the pleura run upward to lymph nodes situated along the subclavian vein and to lymph nodes situated lateral to the lower end of the internal jugular vein. These nodes are on a much deeper plane than those accompanying the external jugular vein. They lie internal to the deep fascia of the neck and behind the sternocleidomastoid muscle. They are the lowermost glands of the deep cervical chain. Neither of these two sets of glands, the subclavian and the deep cervical, would become infected from a tuberculous focus in the apex of the upper lobe of the lung unless both visceral and parietal pleurae were destroyed. The lymph drainage from the lung follows the bronchi and blood vessels to the hilum. The lymph vessels of the visceral pleura run on the surface of the lung under the visceral pleura, and likewise to the hilum, where all terminate in the bronchomediastinal lymph glands. The latter drain into the great veins on each side of the neck, either directly or through the thoracic duct on the left side or through the right lymphatic duct on the right side. They never drain into lymph glands situated along the external jugular vein.

## DERMATITIS

*To the Editor:*—In the plant of the Alger-Sullivan Lumber Company the grader in the planer mill has a dry scaly dermatitis in the web between the index finger and the thumb, and on the opposing sides of thumb and index finger where he holds his marking crayons. The contents of this lumber crayon are paraffin, milori blue and china clay, and the labels are regular printed labels with the usual blue printers' ink. The labels are put on with standard glue, which has been used for years. Is the dermatitis due to paraffin, milori blue, china clay, printers' ink, or the glue? I have not suspected either of the latter two. I have been more inclined to think it is due to the blue.

J. S. TURBERVILLE, M.D., Century, Fla.

ANSWER.—There are several ingredients in these pencils which might cause eczema or dermatitis (the same thing). Paste made from glue sometimes produces a troublesome dermatitis. Printers' ink can produce a dermatitis. No information is available concerning dermatitis produced by milori blue or china clay. Perhaps it might be worthy of mention that the patient's dermatitis may be due to sensitization to certain woods. Of course, none of these things produce a dermatitis except in a person who is unusually sensitive.

## TREATMENT OF LEUKORRHEA

*To the Editor:*—Kindly advise treatment for leukorrhea in an unmarried girl. Kindly omit name.

M.D., Connecticut.

ANSWER.—Leukorrhea in an unmarried girl may be of gonorrheal origin or noninfectious in character. The pathologic condition in nongonorrheal leukorrhea is limited to the cervix and consists in overgrowth of hypersecreting endocervical glands. In case of gonorrheal infection the discharge arises from Skene's ducts as well as from the cervix.

In less severe cases the discharge may be controlled by daily vaginal instillation of 2 cc. of a solution containing 4 cc. of tannic acid in 30 cc. of glycerin. Tampons are insanitary and should not be used. Douches make the patient more comfortable but do not have curative value and are dangerous because they sometimes force infection upward through the cervical canal into the uterus and tubes.

In more severe cases an electric cautery, of the nasal cautery type, may be used to destroy the diseased cervical glands. Infected Skene's ducts may be excised or split open and cauterized.

### SCARLET FEVER ANTITOXIN

*To the Editor:*—As scarlet fever streptococcus antitoxin received favorable comment in "Useful Drugs," I used considerable of it during a recent epidemic, especially for exposed cases prophylactically. While the results were good, with the exception of a high percentage of "serum sickness" (about half), mostly moderate, there has been much criticism by some members of the profession. Is it considered safe to use it or not? Why should this serum cause more "serum sickness" than diphtheria or tetanus antitoxin?

A. C. EITZEN, M.D., Hillsboro, Kan.

ANSWER.—There is now no appreciable difference in the incidence or severity of serum sickness following prophylactic injections of diphtheria or tetanus antitoxin and that following the prophylactic use of scarlet fever antitoxin, provided the scarlet fever antitoxin is properly prepared, concentrated or refined and used in correct dosage.

After scarlet fever antitoxin was described, some manufacturers began the distribution of unrefined serums under the label of Scarlet Fever Antitoxin. These naturally caused frequent and severe serum reactions. For the most part such serums have been withdrawn from the market, though their distribution is still permitted under the Hygienic Laboratory regulations.

The prophylactic use of scarlet fever antitoxin is safe if the usual precautions for the administration of antitoxin are observed.

### BASSLER TREATMENT OF COLITIS—USE OF ACIDOPHILUS MILK

*To the Editor:*—What is your opinion on the Bassler treatment for toxic conditions in the colon? Has such treatment been proved generally good, or do many good practitioners condemn it as a failure? Dr. Bassler is, or was, connected with Fordham University Medical College of New York, also the New York Polytechnic. The treatment consists of an injection twice weekly into the colon by enema of a culture developed twice weekly from a small stool specimen of patient. The stool specimen is put into a medium and grown in electrical incubation. A small portion or particle of this culture is then put in about 5 ounces of bouillon, remaining about twenty-four hours, and used as an enema into the colon. The purpose is to change the flora of the colon from alkaline to acid, promoting the growth of *Bacillus acidophilus*, on the ground that the alkaline is putrefactive and the acid is not. Treatment requires from four to six months. Is the use of lacto-dextrin, acidophilus milk or similar stuff considered good for toxic conditions in the small intestine and colon? Is the intestinal flora of the small intestine normally acid or alkaline?

P. K. HANEY, Tampa, Fla.

ANSWER.—The Bassler treatment of toxic conditions in the colon here described is not generally used. Its rationale has been open to some question. Rettger called attention to the acidophilus organism as the most favorable type to correct abnormal intestinal flora. A modified diet and lactose-dextrine have a tendency to bring the acidophilus organisms into prominence in the stool, but the taking of acidophilus milk or the culture itself produces quicker and better results. At times, in spite of all measures, it is impossible to get the acidophilus organism to predominate in the stool. In such cases by giving a thorough lavage of the colon and then injecting a large quantity of acidophilus organisms, the desired result can be produced. The use of lactose-dextrine, acidophilus milk, and similar products have as their basis the production of an aciduric flora in the intestinal tract, and these inhibit the growth of the proteolytic flora, which are supposed to be a factor in the so-called intestinal toxemia. The content of the small intestine is normally alkaline.

### "PARAPLEGIA DURING TREATMENT FOR SYPHILIS"

*To the Editor:*—I was interested in the letter signed M.D., California, and the discussion concerning paraplegia during treatment for syphilis, which appeared in THE JOURNAL, July 16. Within the last year, I have observed four cases of transverse myelitis following the intensive intravenous administration of neoarsphenamine. Two of the individuals were definitely syphilitic with positive Wassermann reactions in the blood. The test in one instance gave a doubtful result, and in the fourth case it proved negative. The cerebrospinal fluid did not show any abnormalities in any of the individuals except for a moderate pleocytosis in one case.

We were unable to explain these cases on a single basis. It occurred to us that we were possibly dealing in the syphilitic patients with Herxheimer reactions or with thrombotic lesions of the spinal vessels. None of the cases came to postmortem, and the pathologic basis, therefore, could not be definitely ascertained. The possibility of a toxic lesion in the cord similar to the toxic encephalitis induced by arsphenamine cannot be excluded.

E. D. FRIEDMAN, M.D., New York.

# *Medical Education, Registration and Hospital Service*

## COMING EXAMINATIONS

AMERICAN BOARD FOR OPHTHALMIC EXAMINATIONS: Detroit, Sept. 12. Sec., Dr. W. H. Wilder, 122 S. Michigan Blvd., Chicago.

ALASKA: Juneau, Sept. 6. Sec., Dr. Harry C. DeVighne, Juneau.

CALIFORNIA: San Francisco, Oct. 17-20. Sec., Dr. Chas. B. Pinkham, 906 Forum Bldg., Sacramento.

COLORADO: Denver, Oct. 4. Sec., Dr. Philip Work, 1011 Republic Bldg., Denver.

CONNECTICUT: New Haven, Sept. 13. Sec., Homeo. Bd., Dr. Edwin C. M. Hall, 82 Grand Ave., New Haven.

CONNECTICUT: State Board of Healing Arts, New Haven, Oct. 8. Prerequisite to examination. Chairman, Dr. Charles M. Bakewell, Box 1895, Yale Station, New Haven.

GEORGIA: Atlanta, Oct. 11. Sec., Dr. J. W. Palmer, Ailey.

ILLINOIS: Chicago, Oct. 4-6. Supt. of Regis., Mr. V. C. Michels, Springfield.

IDAHO: Boise, Oct. 11. Commissioner of Law Enforcement, Hon. Fred E. Lukens, Boise.

KANSAS: Topeka, Oct. 11. Sec., Dr. A. S. Ross, Sabetha.

MICHIGAN: Lansing, Oct. 11-13. Sec., Dr. Guy L. Connor, 707 Stroh Bldg., Detroit.

MINNESOTA: Minneapolis, Oct. 18-19. Sec., Dr. A. E. Comstock, 636 Lowry Bldg., St. Paul.

MISSOURI: Kansas City, Oct. 17-19. Sec., Dr. James Stewart, Jefferson City.

MONTANA: Helena, Oct. 4-6. Sec., Dr. S. A. Cooney, Power Blk., Helena.

NEW JERSEY: Trenton, Oct. 18-19. Sec., Dr. Chas. B. Kelley, 1101 Trenton Trust Bldg., Trenton.

NEW MEXICO: Santa Fe, Oct. 10-11. Sec., Dr. W. T. Joyner, Roswell.

NEW YORK: Albany, Buffalo, New York and Syracuse, Sept. 19-22. Chief Professional Examination Bureau, Mr. Herbert J. Hamilton, Albany.

OKLAHOMA: Oklahoma City, Sept. 13-14. Sec., Dr. J. M. Byrum, Shawnee.

PORTO RICO: San Juan, Sept. 6. Sec., Dr. D. D. Biascoechea, Box 804, San Juan.

WYOMING: Cheyenne, Oct. 3-5. Sec., Dr. G. M. Anderson, Cheyenne.

## Minnesota June Examination

Dr. A. E. Comstock, secretary of the Minnesota Board of Medical Examiners, reports the written, oral and practical examination held at Minneapolis, June 21-23, 1927. The examination covered 7 subjects and included 60 questions. An average of 75 per cent was required to pass. Forty-four candidates were examined, all of whom passed. The following colleges were represented:

| PASSED<br>College | Year Grad. | Per Cent |
|---|---|---|
| Northwestern University Medical School | (1926) | 86.4 |
| University of Minnesota Medical School | (1926) (1927)* | 81.1, 82.8 92.1 |
| | 82.5, 82.9, 83.8, 83.9, 84.1, 84.4, 84.6, 84.6, 85.1, 85.5, 85.7, 85.8, 86.2, 86.4, 86.4, 87, 87.1, 87.2, 87.2, 87.6, 87.7, 87.9, 88.2, 88.4, 88.5, 88.6, 89.2, 89.2, 89.2, 89.3, 89.3, 89.5, 89.6, 90.1, 90.2, 90.8, 92.1, 92.2 | |
| University of Pennsylvania School of Medicine | (1925) | 94.4 |
| Medical College of the State of South Carolina | (1923) | 83 |

* These candidates have finished their medical courses and received their M.B. degrees, and will receive their M.D. degrees on completion of a year's internship in a hospital.

## California Reciprocity Report

Dr. Charles B. Pinkham, secretary of the Board of Medical Examiners of California, reports that 40 candidates were licensed by reciprocity, whose names were reported June 18, 1927. The following colleges were represented:

| LICENSED BY RECIPROCITY<br>College | Year Grad. | Reciprocity with |
|---|---|---|
| Denver and Gross College of Medicine | (1904) | Utah |
| General Medical College, Chicago | (1924) | Illinois |
| Hahnemann Medical College and Hospital, Chicago | (1908) | Illinois |
| Northwestern University Medical School | (1893) (1911) | Wisconsin Illinois |
| Rush Medical College | (1908) | Oregon (1925) Illinois |
| University of Illinois College of Medicine | (1904) (1911) (1912) | S. Dakota Iowa |
| Indiana University School of Medicine | (1908) | Indiana |
| Medical College of Indiana | (1898) | Indiana |
| State University of Iowa College of Medicine | (1905) | Iowa |
| University of Louisville School of Medicine | (1893) | Idaho |
| Johns Hopkins University School of Medicine | (1923) | Maryland |
| Harvard University | (1924) | Mass. |
| Tufts College Medical School | (1914) | Mass. |
| Detroit College of Medicine and Surgery | (1914) | Michigan |
| University of Minnesota Medical School | (1905) (1924) (1926) | Minnesota Minnesota |
| St. Louis University School of Medicine | (1912) (1916) (1918) | Iowa Missouri |
| Washington University School of Medicine | (1922) | Missouri |

| | |
|---|---|
| John A. Creighton Medical College.....(1908) (1915) (1916) Nebraska | S. Dakota |
| Univ. of Nebraska College of Medicine.(1905) (1921) (1925) | Nebraska |
| Columbia University College of P. & S.....(1913) (1923) | New York |
| Starling-Ohio Medical College, Columbus.....(1908) | Ohio |
| Western Reserve University School of Medicine.....(1924) | Ohio |
| Willamette University Medical Department, Salem....(1913) | Oregon |
| Jefferson Medical College of Philadelphia.....(1912) | Oregon |
| Woman's Medical College of Pennsylvania.....(1918) | Penna. |
| Baylor University College of Medicine.....(1925) | Texas |
| University of Toronto Faculty of Medicine.....(1925) | New York |

## Book Notices

STAMMERING AND ITS TREATMENT. By Samuel D. Robbins, A.B., A.M., Director, Boston Stammerers' Institute. Cloth. Price, $2. Pp. 121. Boston: Boston Stammerers' Institute, 1926.

This is an intelligent attempt to present briefly to stammerers and to the public generally a practical knowledge of the nature of stammering and especially of its treatment as carried out by the author. The presentation is frank, analytic and intelligent, but probably too difficult for practical use by any but the more mature and intelligent stammerers. The greatest value of the book will be found in its perusal by other students of stammering, and to them especially, though also to the general public, it is highly recommended. Our knowledge of stammering is steadily growing, and such books as this will do much to place treatment of the disorder on a more intelligent and standardized basis.

SURGICAL APPLIED ANATOMY. By Sir Frederick Treves. Eighth edition, revised by C. C. Choyce, C.M.G., C.B.E., B.Sc., Professor of Surgery, University of London. Cloth. Price, $4. Pp. 727, with 162 illustrations. Philadelphia: Lea & Febiger, 1927.

This manual has been a familiar one for more than forty years. Written by one of the best surgeons of the older school, it represents a survival of the time when anatomy was the most important course in the medical curriculum. It contains seven hundred pages of closely written matter, dealing essentially with surgical anatomy. Illustrations are infrequent, but as originally designed "the book is intended mainly for the use of students for their final examination in surgery." It is, however, a handy reference book, in which detailed study of illustrations is not required.

TECHNIQUE DE LA RÉACTION DU BENJOIN COLLOÏDAL. Par Georges Guillain, professeur à la Faculté de médecine de Paris, Guy Laroche, médecin des hôpitaux de Paris, et P. Lechelle, médecin des hôpitaux de Paris. Paper. Price, 11 francs. Pp. 36, with illustrations. Paris: Masson & Cie, 1926.

In this brochure the authors discuss the technic and interpretation of the colloidal benzoin reaction in cerebrospinal fluid, a test which they originally described in 1920. The discussion is accompanied by photographs and charts illustrating the colloidal benzoin curves obtained in various pathologic conditions. Of especial interest is the comparative study made by the authors of the colloidal benzoin and the Wassermann reactions. A bibliography is appended, consisting of papers written by the authors and their associates.

DISEASES OF THE INTESTINES. By A. P. Cawadias, O.B.E., M.D., M.R.C.P. Cloth. Price, $6. Pp. 299, with illustrations. New York: William Wood & Company, 1927.

It is probably not exaggeration to say that this is one of the best descriptions of the diseases of the intestines that has appeared for many years. What recommends it is its systematic orderly arrangement, the sound and practical manner of presentation of the subject and what appeals to the physician for whom it is written, a detailed discussion of differential diagnosis. In all textbooks on diseases of the intestines there always appears a lot of discussion of various types of intestinal dyspepsias due to disturbances in the type of food intake and output, the kind of organisms guilty of instigating various types of intestinal diseases, and indefinite description of a still more indefinite condition vaguely called autointoxication. While there may be some excuse for this in a discussion of pathogenesis, in clinical medicine unfortunately one cannot put much of this information to use. As this book is written for the most part for practicing physicians, it seems that it would be much better if such a statement were made emphatic. In practice, the general methods of treatment of bowel conditions by proper management of diet, irrigations where indicated, heat, atropine or what other drugs are indicated should be made clear at the outset. There is an excellent description of the physiology of the nervous system controlling intestinal movements and its rôle in the development and control of diseases of the bowel. That much abused term chronic appendicitis is put in its proper place. There are too many appendectomies for chronic appendicitis. This the author stresses with all the importance it requires. The subject of organic and functional colon stasis and intestinal obstruction are complete in fulness of detail. That of duodenal ulcer, however, is weak. On the whole, this treatise cannot fail but appeal to every one requiring guidance in the diagnosis and treatment of diseases of the bowel.

DIE OHRENHEILKUNDE DER GEGENWART UND IHRE GRENZGEBIETE. Herausgegeben von Otto Körner, o. ö. Professor der Medizin, in Rostock. XI. Die Topographie des Kehlkopfgerüstes. Von Dr. Med. W. Minnigerode. Paper. Price, 18 marks. Pp. 25, with 68 illustrations. Munich: J. F. Bergmann, 1927.

The author presents an unusually interesting study of the framework of the larynx, deriving his data from special anatomic preparations, cross sections of frozen specimens, roentgen-ray examination, and the usual mirror images. In an absorbing manner he portrays the topography of the larynx, describing in detail the relations to the surrounding structures, and the cartilaginous, bony and muscular make-up of the organ. There are numerous illustrations, many of them colored, which go far to make clear the difficult anatomy of the larynx, so often inadequately protrayed even in the larger textbooks.

DIE OHRENKRANKHEITEN IM KINDESALTER MIT EINSCHLUSS DER GRENZGEBIETE. Von Dr. Gustav Alexander, o. Professor der Ohrenheilkunde an der Wiener Universität. Second edition. Paper. Price, 39 marks. Pp. 399, with 115 illustrations. Leipsic: F. C. W. Vogel, 1927.

The first edition of this excellent work was published in 1912. The size of the book has not been changed to any extent and the number of plates and other illustrations is about the same. The author has abbreviated some of his subjects, such as the functional testing of hearing, which were covered in greater detail in the other edition. Among the topics he takes up first are the anatomy and physiology of the ear, together with the various examinations usually employed in otology. The diseases of the external ear, the drum membranes and the middle ear are next presented, and these are dealt with rather extensively. Then follows the discussion of the inner ear and its diseases, with extracranial and intercranial otogenic complications. After this comes a chapter on traumatisms of the ear, and then one on malignant tumors which gives rather detailed consideration together with conditions accompanying systemic diseases. The latter includes acute infectious diseases, such as scarlatina and diphtheria. The final chapter deals with the deaf child and the otologist's relationship to schools for deaf mutes and the hard of hearing. This work, by one of the acknowledged masters of otology, is well worth the study as it embodies many important points that the author has drawn from his large and varied experience. It is systematically arranged, and a complete bibliography accompanies every section of the book.

NUTRITION OF MOTHER AND CHILD. By C. Ulysses Moore, M.D., M.Sc., F.A.C.P., Collins Fellow in Nutritional Research, University of Oregon Medical School. Including Menus and Recipes by Myrtle Josephine Ferguson, B.S., B.S. in H.Ec. Third edition. Cloth. Price, $2. Pp. 236, with 33 illustrations. Philadelphia: J. B. Lippincott Company, 1927.

The primary message of this book is to encourage breast feeding of the young infant. The author not only advises but insists on it by showing that by the proper technic, described in detail, it is possible for practically every mother to nurse her infant at least in part for the first five or six months of its extra-uterine life. He points out that nutrition is the prime factor in health and longevity and that breast feeding is the first requisite for proper nutrition. The newer discoveries of facts that have revolutionized our ideas of nutrition are presented in simple language, yet only scientific facts are presented. The book is essentially for the laity, especially

those mothers who seek to feed their families intelligently and scientifically, and for social workers. In addition to discussing vitamins, deficiency diseases, diet during pregnancy and lactation, detailed technic of breast feeding, with emphasis on the reestablishment of a diminishing supply, artificial feeding and diets for the older child, it includes numerous recipes. The author has perhaps somewhat overstated the case of breast feeding. On page 81, for instance, he quotes from an English psychiatrist "Breast feeding will prevent more insanity than can be cured by all the insane asylums of the world" and certain other passages. However, it seems justifiable to counteract the great tendency of present-day mothers to do away with breast feeding if possible, and especially that of many general practitioners who with insufficient cause frequently advise weaning.

THE TREATMENT OF FRACTURES WITH NOTES UPON A FEW COMMON DISLOCATIONS. By Charles Locke Scudder, A.B., Ph.B., M.D., F.A.C.S., Consulting Surgeon to the Massachusetts General Hospital. Tenth edition. Cloth. Price, $12 net. Pp. 1240, with 2027 illustrations. Philadelphia: W. B. Saunders Company, 1926.

This is a real contribution to the literature. The work contains so much new material and has been so completely revised that it may be looked on as practically new. Every chapter has been materially lengthened, resulting in an increase of 491 pages and 764 new illustrations over the previous edition. The author points out that rigid and strictly standardized methods of fracture treatments are undesirable, as the variety of conditions attending a fracture call for the exercise of careful judgment in the choice of treatment. He attempts to aid the surgeon in selecting the proper form of treatment. The operative treatment is presented as a system by itself, apart from its application to any particular fracture. The author emphasizes the fact that open operation should be resorted to only when it is distinctly indicated. Special subjects have been prepared by certain men chosen because of their interest, training and experience. These chapters, which are really new monographs, include pathologic fractures by Joseph C. Bloodgood, bone repair by Frederic W. Bancroft, fractures of the mandible and maxilla by the oral surgeon Kurt H. Thoma, and anesthesia and anesthetics by Frank L. Richardson. There is a chapter on birth fractures based largely on the monograph of Dr. Truesdell and illustrated almost entirely from the original. Similarly, a chapter is devoted to massage and the author has quoted freely from the monograph "Massage, Its Principles and Practice," by Dr. James B. Mennell. In the preparation of this revision the author has carefully reviewed the enormous literature on the subject and has systematized and condensed this vast fund of information, augmented by his large personal experience, into a useful and practical volume on the present treatment of fractures.

INDIKATIONEN FÜR DIE OPERATIVE BEHANDLUNG DER FRAUENKRANKHEITEN. Von Dr. Walther Benthin, a. ö. Professor an der Albertus-Universität und leitender Arzt der Abteilung für Geburtshilfe und Frauenkrankheiten des städtischen Krankenhauses zu Königsberg i. Pr. Paper. Price, 10.20 marks. Pp. 226. Berlin: Urban & Schwarzenberg, 1927.

This, the author says, is the outgrowth of his own necessities to clarify the indications for the treatment of women's diseases, especially since among the younger gynecologists there is a sort of furor operativus, to the neglect of constitutional, endocrinal, physiologic and medicinal therapy. He has studied the various operative measures proposed and presents his own opinions regarding the best ones. He has used a seminar style of writing to help the student, and has supported his statements with extensive references to the literature. The book is divided into three parts: (1) general considerations of conservative and radical measures, with the limitations and dangers of each, including the social indications in gynecology; (2) the placing of indications in seventeen of the most common gynecologic conditions; (3) reports of sixty-one illustrative cases from the author's practice. The author's main theme is presented in the opening words: The object of the placement of indications is that, on the foundation laid by a diagnosis secured through a thorough examination, taking into consideration the whole body and the environment of the patient, and when it is proved that treatment is necessary, the kind of treatment and the time are so determined and grounded that, with all possible preservation or at least recovery of function, a certain and quick return to health will be secured. The indication and prognosis belong together. Throughout the book care in diagnosis is emphasized, contraindications are given as well as indications, and a conservative tendency in treatment is recognizable. Every teacher of gynecology will welcome this book, the only monograph of its kind, as it gives him in concise, clear and complete paragraphs the necessary information on the questions of what to do, when to do it and how it is best to be done.

APPLIED MUNICIPAL SANITATION. By V. M. Ehlers, Chief Sanitary Engineer, E. G. Eggert, Sanitary Engineer, and Ella G. White, Secretary, Division of Sanitary Engineering, State Health Department. Cloth. Pp. 167, with illustrations. Austin: Texas Association of Sanitarians, 1925.

While rather elementary, this nevertheless fills an oft felt need. It deals with problems of water supply, sewage disposal, mosquito control, milk sanitation, shell-fish sanitation, camps, parks, swimming pools and nuisances in such a way as to be of value both for instruction in the fundamentals of these branches of sanitation and also as a reference book for inspectors and other sanitarians. One of the advantages of this book is the wealth of illustrations showing types of construction recommended and also those frequently found which should be improved. It might be improved by an additional chapter on the administration of municipal health measures.

A TEXTBOOK OF PHARMACOLOGY. By A. D. Bush, B.S., M.D., Professor of Pharmacology, Emory University, Georgia. Cloth. Price, $2. Pp. 182. Philadelphia: P. Blakiston's Son & Company, 1927.

While this book, written somewhat with quiz-compend brevity of style, might meet the needs of the student of pharmacy, one can hardly agree with the author that "the student or practitioner of medicine will find in it all that is of essential value." He who must use medicines daily as his tools for the relief of suffering should be more deeply grounded than he would be after perusal of this textbook, though it may suffice for purposes of preexamination review.

DAS PROBLEM DES CHARAKTERAUFBAUS; SEINE GESTALTUNG DURCH DIE ERBBIOLOGISCHE PERSÖNLICHKEITSANALYSE. Von Dr. Herman Hoffmann, Privatdozent für Psychiatrie und Neurologie an der Universität Tübingen. Paper. Price, 12 marks. Pp. 193. Berlin: Julius Springer, 1926.

The great interest that has developed in the subject of types of personality and their relations with body construction, especially the work of Kretschmer, is an indication of a growing realization of the importance of studying the man as a whole. In this volume the author reviews the various systems of personality classification and construction and then discusses the problems of developing this material in the light of biologic inheritance—the isolation of definite genotypic anlages or genetic radicles which enter into the building up of the mental entity of the individual. The subject is illustrated by the discussion of childhood psychology and the evolution and fate of different types, and makes use of clinical and historical material in a keen-sighted manner. The book is necessarily somewhat technical and requires considerable acquaintance with the subject for its understanding, but it is well planned and can be recommended to all interested in this phase of biology.

ENZYMES: Properties, Distribution, Methods and Applications. By Selman A. Waksman, M.S., Ph.D., Associate Professor of Soil Microbiology, Rutgers University, and Wilburt C. Davison, M.A., M.D., Associate Professor of Pediatrics, Johns Hopkins University School of Medicine. Cloth. Price, $5.50. Pp. 364. Baltimore: Williams & Wilkins Company, 1926.

The authors have correlated, in a concise form, much valuable information with regard to enzymes, and have indicated the original source from which more detailed knowledge may be obtained. Briefly, the arrangement is under the headings of properties of enzymes: introduction, enzymes in biologic processes, chemistry of enzymes and enzymatic reactions, and factors which influence enzymatic reactions; distribution of enzymes in the human and the animal body and in plants and micro-organisms; methods for the preparation and study—enzymes acting on fats and esters, carbohydrates,

proteins and their derivatives, oxidases and oxido-reductases, zymases and catalase; practical applications of enzyme activity —uses in various industrial processes, laboratory reagents, therapeutic agents in clinical medicine and medical diagnosis. In a book relatively so comprehensive, it is surprising to note that there is no reference to the now rather widely used application of enzymes as a means of differentiation between the various organic silver preparations and also to determine the classification of mercurials. The bibliography, although by no means complete, is excellent, and the authors are to be commended particularly on its arrangement. It is one of the best modern books in its field and should exploit a new realm of thought to the average physician, as well as the average chemist, biologist and student of plant and animal life.

## *Books Received*

Books received are acknowledged in this column, and such acknowledgment must be regarded as a sufficient return for the courtesy of the sender. Selections will be made for more extensive review in the interests of our readers and as space permits. Books listed in this department are not available for lending. Any information concerning them will be supplied on request.

MANUEL DE NEUROLOGIE. Tome I. L'anatomie du système nerveux. Une tentative de grouper en système fonctionnel les voies et les centres, de localisation diverse, par lesquels les diverses impressions sensorielles peuvent se traduire en réactions réflexes. Troisième partie. Les systèmes nucléaires dans le pont de varole et dans le pédoncule cérébral. Le système nerveux considéré comme organe d'association réciproque. Le cervelet. Opera omnia. Tome VIII. Par le Dr. C. Winkler, professeur de neurologie et de psychiatrie à l'Université de l'État à Utrecht. Paper. Pp. 377, with 160 illustrations. Haarlem: Erven F. Bohn, 1927.

New volume in systematic anatomy of the nervous system.

A TEXT-BOOK OF PATHOLOGY. By Alfred Stengel, M.D., Sc.D., Professor of Medicine at the University of Pennsylvania, and Herbert Fox, M.D., Professor of Comparative Pathology, and Director of the Pepper Laboratory of Clinical Medicine, University of Pennsylvania. Eighth edition. Cloth. Price, $10. Pp. 1138, with 570 illustrations. Philadelphia: W. B. Saunders Company, 1927.

Latest edition, somewhat revised, of a standard text.

ANATOMICAL, PHYLOGENETICAL AND CLINICAL STUDIES ON THE CENTRAL NERVOUS SYSTEM. By B. Brouwer, Professor of Clinical Neurology, University of Amsterdam. The Herter Lectures of the Johns Hopkins University. Volume XVII, 1926. Cloth. Price, $2.50. Pp. 67, with 16 illustrations. Baltimore: Williams and Wilkins Company, 1927.

Monographic study of the development of the nervous system.

ATLAS DER HAUT- UND GESCHLECHTSKRANKHEITEN ZUGLEICH EIN LEHRBUCH. Von Professor Dr. W. Frieboes, Direktor der dermatologischen Universitätsklinik, Rostock. Lieferung 1. Paper. Price, 10 marks. Pp. 48, with 678 illustrations. Leipsic: F. C. W. Vogel, 1927.

Photographs, colored and otherwise, of diseases of the skin, with brief text.

THE APPLICATION OF MODERN CLINICAL MEDICINE TO THE PROBLEM OF MEDICAL SELECTION. By Francis H. McCrudden, M.D., Assistant Medical Director, New England Mutual Life Insurance Company. Paper. Pp. 68. Boston: New England Mutual Life Insurance Company, 1927.

Function tests in selecting good insurance risks.

PHYSIKALISCHE GRUNDLAGEN DER LICHTTHERAPIE. Von Priv.-Doz. Dr. med. et phil. H. Guthmann, Oberarzt der Universitäts-Frauenklinik Frankfurt a. M. Band X, Sonderbande zur Strahlentherapie. Paper. Pp. 216, with 178 illustrations. Berlin: Urban and Schwarzenberg, 1927.

Another physical basis for light therapy.

AMERICA'S HUMAN WEALTH. The Money Value of Human Life. By Edward A. Woods, M.A., and Clarence B. Metzer, M.A. Cloth. Price, $2. Pp. 193. New York: F. S. Crofts & Co., 1927.

Proves that a nation's greatest asset is its people and that our asset is insufficiently insured.

EVOLUTION OF PREVENTIVE MEDICINE. By Sir Arthur Newsholme, K.C.B., M.D., F.R.C.P. Cloth. Price, $3. Pp. 226, with 5 illustrations. Baltimore: Williams and Wilkins Company, 1927.

A historical survey of the development of preventive medicine.

HÆMATOLOGICAL NOMOGRAM. By E. J. Warburg. Boards. Copenhagen: Levin & Munksgaard, 1927.

LIPPINCOTT'S POCKET FORMULARY. By George E. Rehberger, M.D. Leather. Price, $3.50. Philadelphia: J. B. Lippincott Company, 1927.

Tabular guide to U. S. P., N. F. and N. N. R. with suggestive prescriptions for various diseases.

ALPALFER ANN'S AFERISMS. By Charles F. Rideal. Boards. Price, $1. Pp. 97, with illustrations. New York: Avondale Press, 1927.

Pictures and wise cracks without relation to medicine and not worth the price anyway.

THE AMERICAN ILLUSTRATED MEDICAL DICTIONARY. A New and Complete Dictionary of the Terms Used in Medicine, Surgery, Dentistry, Pharmacy, Chemistry, Nursing, Veterinary Science, Biology, Medical Biography, etc., with the Pronunciation, Derivation, and Definition Including Collateral Information of an Encyclopedic Character. By W. A. Newman Dorland, A.M., M.D., F.A.C.S., Member of the Committee on Nomenclature and Classification of Diseases of the American Medical Association. Fourteenth edition. Leather. Price, $7. Thumb Index, $7.50. Pp. 1388, with illustrations. Philadelphia: W. B. Saunders Company, 1927.

HANDBUCH DER PATHOGENEN MIKROORGANISMEN. Herausgegeben von W. Kolle, R. Kraus und P. Uhlenhuth. Lieferung 5, Band III. Serumtherapie der Vergiftungen durch tierische Gifte (Schlangen, Skorpione, Spinnen). Von Prof. Dr. R. Kraus, etc., etc. Third edition. Paper. Price, 14.60 marks. Pp. 192, with 50 illustrations. Jena: Gustav Fischer, 1927.

THE MEDICAL DEPARTMENT OF THE UNITED STATES ARMY IN THE WORLD WAR. Volume XI. Surgery. Part One: General Surgery, Orthopedic Surgery, Neurosurgery. Prepared under the Direction of Maj. Gen. M. W. Ireland, The Surgeon General. Cloth. Price, $4. Pp. 1324, with illustrations. Washington: Government Printing Office, 1927.

HANDBUCH DER PATHOGENEN MIKROORGANISMEN. Herausgegeben von W. Kolle, R. Kraus, und P. Uhlenhuth. Lieferung 6, Band II. Aktive Immunisierung und Herstellung von Antigenen. Von Prof. Dr. M. Ficker, etc., etc. Third edition. Paper. Price, 21 marks. Pp. 316, with 21 illustrations. Jena: Gustav Fischer, 1927.

STÖRUNGEN DES TRIEB- UND AFFEKTLEBENS (DIE PARAPATHISCHEN ERKRANKUNGEN). Vol. III. Die Geschlechtskälte der Frau. (Eine Psychopathologie des weiblichen Liebeslebens.) Von Dr. Wilhelm Stekel. Third edition. Paper. Price, 25 marks. Pp. 559. Berlin: Urban & Schwarzenberg, 1927.

PRÁCTICAS DE UROLOGÍA Y SIFILIOGRAFÍA. Por los Doctores Pedro Cifuentes, jefe del servicio de urologia, del Hospital de la Princesa de Madrid, y E. A. Sáinz de Aja, jefe de servicio de dermosifiliografía del Hospital de San Juan de Dios. Paper. Pp. 533, with 144 illustrations. Madrid: 1927.

ATLAS DER HISTOTOPOGRAPHIE GESUNDER UND ERKRANKTER ORGANE. Von Dr. Erwin Christeller, Direktor der pathologisch-anatomischen Abteilung des städtischen Rudolf Virchow-Krankenhauses. Cloth. Price, 90 marks. Pp. 88, with 274 illustrations. Leipsic: Georg Thieme, 1927.

COLLECTED PAPERS OF THE MAYO CLINIC AND THE MAYO FOUNDATION. Edited by Mrs. M. H. Mellish, H. Burton Logie, M.D., and Charlotte E. Eigenmann, B.A. Volume XVIII, 1926. Cloth. Price, $13. Pp. 1329, with 386 illustrations. Philadelphia: W. B. Saunders Company, 1927.

THE DETERMINATION OF SULPHUR DIOXIDE IN FOODS. By G. W. Monier-Williams, O.B.E., M.A., Ph.D. Reports on Public Health and Medical Subjects. No. 43. Paper. Price, 1s. 3d. net. Pp. 56. London: His Majesty's Stationery Office, 1927.

THIRTY-EIGHTH ANNUAL REPORT OF THE WESLEY MEMORIAL HOSPITAL FROM JANUARY 1, 1926, TO JANUARY 1, 1927. In memory of William Deering and Abby Derring Howe. Cloth. Pp. 176, with illustrations. Chicago, 1926.

HERZHINTERWAND UND OESOPHAGEALE AUSKULTATION. Von Dr. S. Bondi, Privatdozent für innere Medizin an der Universität Wien. Paper. Price, 8.40 marks. Pp. 114, with 32 illustrations. Vienna: Julius Springer, 1927.

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THE ROCKEFELLER FOUNDATION. A Review for 1926. By George E. Vincent, President of the Foundation. Paper. Pp. 54, with illustrations. New York, 1927.

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# Medicolegal

### Hearsay Testimony of Physician as to Payments

*(Lentine v. McAvoy (Conn.), 136 Atl. R. 76)*

The Supreme Court of Errors of Connecticut says that in this action to recover damages for alleged wanton and malicious battery committed on the plaintiff by the defendant (a policeman), a ruling on evidence was incorrect where a physician had no knowledge as to the amount paid him by the plaintiff, or the date of payment, but was permitted over the defendant's objection to testify as to those facts from information given him by a nurse employed by him. The objection that the evidence was hearsay and that the books were the best evidence was well taken.

### Time Limit for Presenting Bill and Beginning Suit

*(Henry v. American Enamel Co. (R. I.), 136 Atl. R. 3)*

The Supreme Court of Rhode Island, in affirming a decree in favor of the employer, says that the petitioner sought allowance of his bill for medical services rendered to an employee of the respondent. The services were rendered at the instance of the employee, beginning, Sept. 17, 1920. The bill of the petitioner against the employer was presented, Jan. 31, 1924, and the petition in this proceeding under the workmen's compensation act was filed, March 22, 1926. Article 2, section 5, of the act permits the employee to select his own physician, and provides that the employer shall become liable to such physician for reasonable fees, provided the physician gives written notice to the employer within seven days after beginning treatment and presents his claim for payment to the employer within three months after conclusion of treatment. Treatments were concluded in this case, Oct. 18, 1920.

One objection to the present claim was that the petitioner had failed to give written notice of the employment within seven days. But the injured employee, after being sent to a hospital by the respondent (employer), stated to the latter his preference for treatment by the petitioner. The employer knew within the seven days that the employee was being treated by the petitioner. Although written notice of employment is made a proviso to allowance of the physician's claim, such notice could have added nothing to the employer's information, nor could failure to give it have affected the employer prejudicially. The employer had no power to veto the choice. Actual knowledge of the physician's name within seven days after commencement of treatment should operate as a waiver of the employer's right to further notice in writing. Such holding is in keeping with the spirit of the act seeking to provide redress without insistence on useless technicalities.

But waiver of the employer's right to have the bill sent is not a necessary sequence of waiver of written notice of the physician's employment. The sending of a bill is to give the employer definite information. An outstanding purpose of the compensation act is to provide speedy relief for lost earning capacity of an injured employee, and in order to do justice to the employer, it seeks to secure to him such information as will enable him early to check up and verify the claims for lost time and employees' medical expenses. The act compels the employer to assure these payments by insurance or otherwise. It contemplates a full and prompt disclosure of the facts to the employer. The employee who selects his own physician does not act as agent for the employer in so doing. The employer does not, by failure to protest against a physician, ratify his employment by the employee or set the stamp of his approval thereto. The employer might even disapprove of the selection. If so, he would certainly want early information about the amount of the bill. In addition to his interest in the amount of the bill, the employer is interested in the length of time the employee's injury continues or is claimed to have continued, and is entitled to an opportunity to investigate the reasonableness of the claim at or about the time it accrues. In the case before the court, no knowledge of the amount of the physician's bill came to the employer for more than three years after it had accrued. Because the employer knew the physician's name, the right to receive a bill within three months from the conclusion of the physician's treatments was not waived. Dismissal of the petition would have been warranted because of failure to send the petitioner's bill within three months after treatments ceased.

The claim for the physician's services if paid and made by the employee, as it could have been, would have been an employee's claim for compensation subject to the two-year statute of limitations in the workmen's compensation act. As presented by the physician apart from the claim of the employee, it was not an "employee's claim for compensation" within the meaning of the act. The later insertion in the act of a physician's right to direct procedure against the employer created another claimant. The physician's rights against the patient who summons him remain unimpaired. The claim, though not an employee's claim, is one for compensation under the act. It has no existence or enforceability apart from the act. The physician could recover whatever might be reasonable in a suit at law against the employee on the direct contract, and he might sue thereon within six years; but he cannot recover such an amount against the employer unless it be smaller in amount than that prescribed by the act. The court does not believe that the legislature intended in the workmen's compensation act to apply different statutes of limitations to different claims brought under the act. The conclusion is that the petitioner was barred from recovery both by failure to present his bill within three months of termination of his services and for failure to commence legal proceedings within two years after the occurrence of the injury.

### Sterilization Upheld by United States Supreme Court

*(Buck v. Bell (U. S.), 47 Sup. Ct. R. 584)*

The Supreme Court of the United States, in affirming a judgment of the Supreme Court of Appeals of Virginia, says that the defendant, superintendent of the state colony for epileptics and feebleminded, was ordered to perform the operation of salpingectomy on the plaintiff for the purpose of making her sterile. She was a feebleminded white woman who was committed to the state colony. She was the daughter of a feebleminded mother in the same institution, and the mother of an illegitimate feebleminded child. She was 18 years old at the time of the trial of her case in the latter part of 1924.

An act of Virginia approved, March 20, 1924, recites that the health of the patient and the welfare of society may be promoted in certain cases by the sterilization of mental defectives, under careful safeguard, etc.; that the sterilization may be effected in males by vasectomy and in females by salpingectomy, without serious pain or substantial danger to life; that the commonwealth is supporting in various institutions many defective persons who if now discharged would become a menace but if incapable of procreating might be discharged with safety and become self-supporting with benefit to themselves and to society; and that experience has shown that heredity plays an important part in the transmission of insanity, imbecility, etc. The statute then enacts that whenever the superintendent of certain institutions including the above-named state colony shall be of opinion that it is for the best interest of the patients and of society that an inmate under his care should be sexually sterilized, he may have the operation performed on any patient afflicted with hereditary forms of insanity, imbecility, etc., on complying with the very careful provisions by which the act protects the patients from possible abuse. There can be no doubt that so far as procedure is concerned the rights of the patient are most carefully considered, and as every step in this case was taken in scrupulous compliance with the statute and after months of observation, there was no doubt that in that respect the plaintiff had had due process at law.

The attack was not on the procedure but on the substantive law. It seemed to be contended that in no circumstances could such an order be justified. It certainly was contended that the order could not be justified on the existing grounds. The judgment found the facts that have been recited and that the plaintiff was the probable potential parent of socially

inadequate offspring, likewise afflicted, that she might be sexually sterilized without detriment to her general health and that her welfare and that of society would be promoted by her sterilization, and thereupon made the order. In view of the general declarations of the legislature and the specific findings of the court obviously this court cannot say as matter of law that the grounds did not exist, and if they existed they justified the result. This court has seen more than once that the public welfare may call on the best citizens for their lives. It would be strange if it could not call on those who already sap the strength of the state for these lesser sacrifices, often not felt to be such by those concerned, in order to prevent our being swamped with incompetence. It is better for all the world if, instead of waiting to execute degenerate offspring for crime or to let them starve for their imbecility, society can prevent those who are manifestly unfit from continuing their kind. The principle that sustains compulsory vaccination is broad enough to cover cutting the fallopian tubes. *Jacobson* v. *Massachusetts*, 197 U. S. 11, 25 S. Ct. 358. Three generations of imbeciles are enough.

But, it is said, however it might be if this reasoning were applied generally, it fails when it is confined to the small number who are in the institutions named and is not applied to the multitudes outside. It is the usual last resort of constitutional arguments to point out shortcomings of this sort. But the answer is that the law does all that is needed when it does all that it can, indicates a policy, applies it to all within the lines, and seeks to bring within the lines all similarly situated so far and so fast as its means allow. Of course so far as the operations enable those who otherwise must be kept confined to be returned to the world, and thus open the asylum to others, the equality aimed at will be more nearly reached.

### Commitment to State Hospital as a Defense to Crime

*(People v. McConnell (Calif.), 252 Pac. R. 1068)*

The District Court of Appeal of California, first district, division 1, in affirming a judgment of conviction of the defendant of an attempt to commit burglary on March 27, 1925, says that one defense was insanity. In support of that defense there was admitted in evidence a judgment and order of commitment of the defendant as an insane person to the Stockton State Hospital. There was also admitted in evidence, under the objection of the defendant, a certificate of the medical superintendent of the hospital that the defendant was not insane, and was discharged on Nov. 3, 1925. Certain medical evidence was also introduced to show that the defendant was not insane. He contended that the trial court erred in the admission of this evidence as to his sanity, as it tended to impeach the judgment of the superior court, which declared him to be insane, such judgment being in full force and effect. There was no merit in this objection. It has been held in California that, in proceedings for the commitment of a person to a state hospital, there is no judgment roll in the sense that it determines conclusively anything; that the commission established in each county to ascertain the mental condition of one alleged to be insane is purely a creature of the statute, the sole duty of which is to inquire and determine whether the mental condition of the person examined is such as to warrant his detention in the asylum for treatment. It is not intended as a tribunal in which the status of the alleged insane person is fixed. Conceding the commitment to have been properly received as evidence of the defendant's insanity, it was not, therefore, conclusive on the subject.

In criminal cases a partial insanity, or an insanity with respect to certain subjects, is not incompatible with the possession of mental capacity sufficient to make the party liable to punishment for his acts. It does not follow, therefore, because one was so committed in the manner indicated, that the commitment is proof that such person was insane to the extent that the law would exempt him from responsibility for his criminal acts. There are many kinds and degrees of insanity, and it is not every kind or degree which will relieve a person from criminal responsibility, and the degree of mental impairment which would authorize his confinement in an asylum for the insane may be entirely different from the degree of mental derangement which will relieve him from responsibility for his criminal acts. One may be insane on one or several subjects, and for that reason a proper person for confinement in a state asylum to be cared for and treated for his mental disorder, and yet at the same time such person may be perfectly sane on all other subjects, and entirely responsible under the law for a criminal act committed by him. The testimony of a physician was therefore properly admitted to show that, while the defendant was addicted to the use of narcotics, he fully appreciated the difference between right and wrong, and was not insane in a legal sense.

### Expert Evidence in Action for Alleged Malpractice

*(Vaughan v. Memorial Hospital (W. Va.), 136 S. E. R. 837)*

The Supreme Court of Appeals of West Virginia affirmed a judgment setting aside for error in the admission of evidence a verdict for $4,500 damages which the plaintiff recovered against the defendant for alleged malpractice after he had been admitted to the defendant hospital two days after he was injured by a fall of slate which broke two metatarsal bones in his right foot near where they joined the toes and bruised and abraded the foot. The trial court set aside the verdict on the ground that certain hypothetic questions to a physician and the answers thereto went to the jury over objection. It was clear that these questions and answers did not contain all the facts, conditions and circumstances claimed by either party, which prompted the treatment given by the surgeons at the hospital. In stating a hypothetic question, the hypothesis must be based on a state of facts which the evidence in the cause tends to prove. The object of this opinion evidence was to show that in the treatment of the fractured bones the defendant did not exercise such ordinary skill and diligence as is ordinarily used by the average surgeon in good standing in similar localities and in the same general line of practice, regard being had as to the state of medical science at the time. To make such opinion evidence of probative value, it should be based on the pertinent facts and not on a portion of them which would call for a totally different treatment. No mention was made of the bad condition of the foot when the plaintiff was taken for treatment. It was swollen to twice its size, was lacerated, exuding pus, and was infected and in a dangerous state. In other questions propounded and answered, a fuller statement of facts and theories having support in the evidence were incorporated; but the questions and answers here under consideration were clearly improper, in view of the uncontroverted facts, and would tend to confusion, and possibly mislead the jury on the main issue.

The controlling question which should not be lost sight of in the trial was, Did the defendant use the same degree of reasonable and ordinary care, skill and diligence in the treatment of the fractured bones as physicians and surgeons in the same general line of practice would have used, time and locality being taken into consideration? There was no contract to exercise the highest degree of care, skill and diligence known to the profession; nor was there a contract of insurance that a perfect cure would be effected. Obviously, it was necessary to ascertain in this case what would have been the usual care, diligence and skill of the average members of the profession in the locality or similar localities in the same line of practice, regard being had to the state of medical and surgical science at the time. Then, did the defendant meet that standard of degree and care?

In determining these questions, the evidence of the physicians and surgeons should have peculiar weight. The ordinary layman does not know whether a particular surgical treatment accords with the standard or usual treatment sanctioned by the profession in that or similar localities. The patient cannot fix a standard of his own; neither can the jury. The defendant offered and was refused an instruction which would have told the jury that it was bound by the evidence of the physicians who testified, in determining whether the defendant's physicians exercised such reasonable and ordinary skill and diligence as is ordinarily exercised by members of the medical profession in good standing in similar localities in the same line of practice, regard being had as to the state of medical science at the time. No other instruction pointed out to the jury how it should arrive at the determination of

that question. While the word "bound" used in the instruction was probably too broad, this court thinks that an instruction embodying the peculiar weight which should be accorded to evidence of members of the profession regarding the usual care and diligence exercised by its members should have been given.

The fact that the plaintiff's fracture was treated, and the ultimate result was that the bones did not unite, was not prima facie proof of negligence. The doctrine of res ipsa loquitur (the thing speaks for itself) does not apply. The negligence of a surgeon is ascertained by pointing to something he should have done, or did do, which was not in accord with reasonable care and diligence as practiced by the accredited members of the profession in that locality or similar locality, and is not ascertained by the results; for a surgeon may use the best judgment, skill and care, using all the recognized means available, and yet not effect a cure.

### Order for Change of Physicians and Hospitalization

*(Lamire v. Industrial Commission et al. (Minn.), 212 N. W. R. 415)*

The Supreme Court of Minnesota, in discharging a writ of certiorari to review an order of the industrial commission of Minnesota providing for a change of physicians and hospitalization, says that the order sought to be reviewed was made pursuant to section 4279 of the general statutes of 1923. Thereby the industrial commission is empowered, on the request of either employee or employer, to "order a change of physicians and designate a physician suggested by the injured employee or by the commission itself." It is thus apparent that the order is wholly of an administrative nature. It is not an award or disallowance of compensation and does not involve "the merits of the case or any part thereof," within the meaning of section 4320 concerning the review of orders of the industrial commission by certiorari.

### Confinement to Hospital Counted Against Sentence

*(State v. Brouillette (La.), 111 So. R. 491)*

The Supreme Court of Louisiana says that, under sentences for selling and possessing intoxicating liquor for sale for beverage purposes, the defendant had 180 days to serve in prison. After he had served seventy-eight days of the time he was found to be ill, and on the advice of a competent physician was sent for treatment to a public hospital, where he remained confined for sixty-two days. When he left the hospital he did not return to jail, but remained at large enjoying the sunshine and fresh air, which the hospital physicians (and he himself) thought would be conducive to his better health and physical welfare. After some weeks he returned to the hospital and remained there fifteen days, when he was discharged. He was then apprehended by the sheriff and placed again in jail to serve the remainder of his sentence, which the sheriff contended should be 180 days less the days actually passed in jail.

Act 251 of 1918 provides that "where large numbers of prisoners are confined in it [a jail, prison or lockup] it shall be the duty of the proper authorities in charge to provide hospital quarters with necessary arrangement, conveniences, attendants, etc." Manifestly it was not the intention of the legislature that the time during which a prisoner was confined in the prison hospital should not be counted as part of his time in jail; otherwise a prisoner who might be unfortunate enough to incur a severe spell of sickness might have his time in jail doubled or tripled or even quadrupled. And although the law does not require that hospital quarters should be provided in prisons, unless where "large numbers" of prisoners are confined, yet this surely does not mean, in this humane age, that where there are only small numbers of prisoners confined, such prisoners are to receive no adequate care and attention should they happen to become ill. Hence, from necessity of the thing, where a prisoner falls ill in a prison which is not provided with proper hospital facilities, it follows that humane judge and sheriff have no other recourse but to use the hospital facilities nearest at hand; for a prisoner is no more to be done to death through neglect than by ill treatment. Hence it follows, in the opinion of this court (and the court feels sure that its view will be indorsed by enlightened public opinion generally), that a prisoner confined by illness to a hospital, whether within the confines of the prison itself or elsewhere, is entitled to count the time of such confinement against his sentence.

On the other hand, this court cannot subscribe to the doctrine that on his release from a hospital a prisoner is entitled to resume his status of complete freedom and go at large because he and his physicians may agree (as we all do) that fresh air and sunshine are more conducive to health and physical welfare than confinement in more or less close quarters. On that hypothesis jails would soon become superfluous and imprisonment a mere idle formality. This court is therefore of opinion that when this man, on his discharge from the hospital, failed to return to prison, he became an *escape* in law, if not in fact, and that he must return to finish that part of his sentence which had not then expired. In other words, the court's conclusion is that he had served seventy-eight days plus sixty-two days, or 140 days of his sentence, and had therefore forty days additional to serve, at the end of which time he would be entitled to be released.

### When a Frenzy Arising from Jealousy Is Not Insanity

*(State v. Butchek (Ore.), 253 Pac. R. 367)*

The Supreme Court of Oregon, in affirming a judgment of conviction of murder, says that in support of his motion for a new trial the defendant filed a written opinion by an eminent alienist to the effect that the defendant was laboring under the mental delusion that his wife had been unfaithful to him, "and that his normal judgment would be impaired with reference to his knowledge of right and wrong." In opposition thereto, the state filed a written opinion by another eminent alienist controverting the showing made by the defendant. In Oregon the law presumes every man to be sane until he establishes his insanity beyond a reasonable doubt. The test of criminal responsibility in Oregon is the power to discriminate between right and wrong. A frenzy arising from jealousy, in a mind unimpaired by disease and not unbalanced by heredity, is not insanity, within the meaning of the code.

## Society Proceedings

### COMING MEETINGS

American Academy of Ophthalmology and Otolaryngology, Detroit, September 12-16. Dr. W. P. Wherry, Bankers Reserve Life Building, Omaha, Secretary.

American Association of Obstetricians, Gynecologists and Abdominal Surgeons, Asheville, N. C., September 15-17. Dr. J. E. Davis, 111 Josephine Avenue, Detroit, Secretary.

American Electrotherapeutic Association, New York, September 12-16. Dr. Richard Kovacs, 223 East Sixty-Eighth Street, New York, Secretary.

American Hospital Association, Minneapolis, Oct. 10-14. Dr. William H. Walsh, 18 East Division Street, Chicago, Executive Secretary.

American Public Health Association, Cincinnati, Oct. 17-20. Mr. Homer N. Calver, 370 Seventh Avenue, New York, Executive Secretary.

American Roentgen Ray Society, Montreal, Canada, September 20-23. Dr. C. L. Martin, Baylor Hospital, Dallas, Texas, Secretary.

Association of Military Surgeons of the United States, Carlisle Barracks, Pennsylvania, October 6-8. Dr. J. R. Kean, Army Medical Museum, Washington, D. C., Secretary.

Central States Pediatric Society, Cleveland, Oct. 14-15. Dr. H. T. Price, Westinghouse Building, Pittsburgh, Secretary.

Colorado State Medical Society, Glenwood Springs, September 6-8. Dr. F. B. Stephenson, Metropolitan Building, Denver, Secretary.

Delaware State Medical Society, Farnhurst, Oct. 11-12. Dr. W. O. La Motte, Industrial Trust Building, Wilmington, Secretary.

Indiana State Medical Association, Indianapolis, September 28-30. Mr. T. A. Hendricks, Hume-Mansur Building, Indianapolis, Executive Secretary.

Kentucky State Medical Association, Owensboro, October 3-6. Dr. A. T. McCormack, 532 West Main Street, Louisville, Secretary.

Missouri Valley, Medical Society of the, Des Moines, Iowa, September 14-16. Dr. Charles Wood Fassett, 115 East Thirty-First Street, Kansas City, Mo., Secretary.

New York and New England Association of Railway Surgeons, New York, Oct. 21-22. Dr. Horace H. LeSeur, 41 Jackson Street, Batavia, N. Y., Secretary.

Pennsylvania, Medical Society of the State of, Pittsburgh, Oct. 3-6. Dr. Walter F. Donaldson, Jenkins Arcade, Pittsburgh, Secretary.

Vermont State Medical Society, Middlebury, Oct. 13-14. Dr. W. G. Ricker, 29 Main Street, St. Johnsbury, Secretary.

Virginia, Medical Society of, Petersburg, Oct. 18-20. Miss Agnes V. Edwards, 104½ West Grace St., Richmond, Secretary.

Wisconsin, State Medical Society of, Eau Claire, September 21-23. Mr. J. G. Crownhart, 153 Oneida Street, Milwaukee, Executive Secretary.

# Current Medical Literature

## AMERICAN

The Association library lends periodicals to Fellows of the Association and to individual subscribers to THE JOURNAL in America for a period of three days. No foreign journals are available prior to 1921, nor domestic prior to 1923. Periodicals published by the American Medical Association are not available for lending, but may be supplied on order. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested).

Titles marked with an asterisk (*) are abstracted below.

### American Heart Journal, St. Louis

**2**: 479-596 (June) 1927

*Influence of Changes in Cardiac Rate and Irregular Action of Heart on Coronary Circulation. G. H. Miller, F. M. Smith and V. C. Graber, Iowa City.—p. 479.
*Cardiac Pain in Paroxysmal Tachycardia. A. R. Barnes and F. A. Willius, Rochester, Minn.—p. 490.
*Paroxysmal Cardiac Pain in Young Adults with Rheumatic Valvular Heart Disease. S. P. Schwartz, New York.—p. 497.
*Treatment of Hypertension. J. P. O'Hara, Boston.—p. 510.
*Unusual Form of Gallop Rhythm. L. A. Conner, New York.—p. 514.
Factors Affecting Disappearance Time of Intradermal Injections. H. L. White and E. Irvine-Jones, St. Louis.—p. 517.
Reflexes from Peritoneal Viscera to Heart: XVIII. J. F. Pearcy and H. Howard, Chicago.—p. 530.
*Interpretation of Pulse Pressure. J. M. Read, San Francisco.—p. 541.
Cardiac Aneurysms. L. M. Morris, San Francisco.—p. 548.
Elimination of Effects of Alternating Currents on String Galvonometer. D. Felberbaum, New York.—p. 560.
Heart Block with Conclusive Syncope. J. D. Heard, W. R. Marshall and F. S. Adams, Pittsburgh.—p. 562.
Signs of Aortic Insufficiency in Absence of Aortic Lesion. E. Holt, New York.—p. 573.
Acute Staphylococcus Aureus Endocarditis. L. M. Warfield, Milwaukee.—p. 576.

**Changes in Cardiac Rate and Coronary Circulation.**—The effect on the coronary circulation of changes in the cardiac rate was studied by Miller et al. both on the isolated heart and on the heart in situ. A reduction and an acceleration of the cardiac rate were, within certain limits, associated with a decrease and an increase in the rate of the coronary circulation. The most striking changes in the rate of the coronary flow were observed in those instances in which relatively great changes in cardiac rate were induced. It is suggested, however, that a heart cannot be accelerated progressively to extreme degrees with an accompanying increase in the coronary circulation. In the very slow cardiac rates induced by vagal stimulation, the rate of flow from the coronary sinus was reduced from 20 to 30 per cent below that observed during the control period. The production of auricular or ventricular premature contractions did not have any significant effect on the rate of flow from the coronary sinus. In auricular fibrillation, the rate of the coronary circulation either remained fairly constant or was moderately accelerated. The results seemed to depend on the rate and the force of the ventricular contractions associated with the absolute irregularity.

**Cardiac Pain in Paroxysmal Tachycardia.**—Nineteen cases of paroxysmal tachycardia were studied by Barnes and Willius, in which the pain was similar in type and location to that seen in cases of angina pectoris. The pain is chiefly distinguished from that of angina pectoris by the absence of the relation of the pain to factors which precipitate attacks of angina pectoris, and also by the fact that the painful seizures tend to occur over a long period of years without a serious outcome. The diagnosis rests on the demonstration of evidence that the pain is an accompaniment of attacks of paroxysmal tachycardia. In contrast to the pain of angina pectoris, except that which occurs in coronary occlusion, the pain in paroxysmal tachycardia has a much longer duration as a rule. Treatment of the pain which occurs with attacks of paroxysmal tachycardia consists in measures which have as their objective the control of the paroxysms of rapid heart action.

**Paroxysmal Cardiac Pain.**—Five cases are reported by Schwartz of young adults between the ages of 16 and 20, suffering from chronic rheumatic cardiac valvular disease, whose main presenting symptom was severe paroxysmal cardiac pain during a certain critical period. All of these patients had an antecedent history of rheumatic fever and all showed multiple valvular involvement of the heart of some duration. The paroxysmal attacks of pain were mainly nocturnal in type and were accompanied by increased pulse rate and respirations, marked rises in blood pressure, violent pulsations of the vessels of the neck, severe headache and variable vasomotor phenomena. The onset of these attacks was always during an afebrile period, and came on from one to twelve years after the first signs of rheumatic fever. The recurrences of cardiac pain were observed to occur during a period of from nine months to one year in four successive patients. In a fatal case they were noted one month prior to death. Four of the five patients are living, several years after the "crucial period," free from all symptoms of pain. Such periods of recurrent precordial pain in young patients with chronic rheumatic cadiac valvular disease do not in themselves indicate a poor prognosis as to life.

**Treatment of Hypertension.**—The actual treatment of the hypertensive individual, O'Hara says, aims largely at the reduction of excessive vasoconstriction. This may be accomplished by a careful cutting down of mental and physical effort, by enforced periods of relaxation, by diet, by drugs and probably by the liver extract when it is perfected.

**Gallop Rhythm.**—The phenomenon seen by Conner in ten cases consists of a great exaggeration of the ordinary form of early diastolic gallop, in which the gallop sound is so loud and the corresponding palpable shock so strong as to dominate completely the cardiac signs. The sound is much louder than either of the two heart sounds which immediately precede it and is sharp and short; the shock is correspondingly sharp and quick and is readily appreciable to the eye as a quick outward rebound of a circumscribed area of the chest wall over the intercostal space where it occurs. The sound and shock resemble closely, but are even more pronounced than, the first heart sound and the systolic shock in typical cases of mitral stenosis. When the phenomenon occurs in cases of mitral disease, the very loud early diastolic sound adds a confusing factor to the auscultatory signs which only accurate timing will serve to identify, but when the condition has once been seen it is easily recognized thereafter. The phenomenon has been observed in a type of disease in which the usual forms of gallop rhythm are rare. The most striking examples have been found in patients with advanced mitral disease who have entered the hospital in a state of extreme congestive heart failure, with orthopnea, cyanosis, dropsy and pulsating liver and neck veins. Four of the ten cases were of this sort. In four other cases the gallop appeared in patients with severe rheumatic fever and some valvular injury, but without severe heart failure. The ninth case was associated with coronary thrombosis and the tenth with essential hypertension.

**Interpretation of Pulse Pressure.**—Read's observations suggest that the physiologic significance of elevated pulse pressure, with normal diastolic pressure, is increased stroke volume.

### American Journal of Physiology, Baltimore

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Weight and Month of Birth. W. T. Porter and P. C. Baird, Jr., Boston.—p. 1.
Electrical Phenomena of Body During Sleep. C. Landis, Pittsburgh.—p. 6.
*Experimental Feeding of Fresh Anterior Pituitary Substance to Hypophysectomized Rat. P. E. Smith, San Francisco.—p. 20.
*Effect of Pituitary Extract on Carbohydrate Metabolism. H. M. Hines, C. E. Leese and J. D. Boyd, Iowa City.—p. 27.
Determination of Formula for Surface Area. G. R. Cowgill and D. L. Drabkin, New Haven, Conn.—p. 36.
*Chemical Activity of Spleen: I. Relation of Spleen to Methemoglobin. G. B. Ray and B. B. Stimson, Clevelnad.—p. 62.
*Constituents of Sweat, Urine and Blood: Gastric Acidity and Other Manifestations Resulting from Sweating: I. Chlorides. G. A. Talbert and C. O. Haugen, University, N. D.—p. 74.
*Id.: II. Total Nitrogen of Sweat and Urine: Total Nonprotein Nitrogen of Blood. G. A. Talbert, S. Silvers and W. Johnson, University, N. D.—p. 81.
*Duration of Life After Suprarenalectomy: Prolonging It by Injections of Sodium Salts, Glucose and Glycerol. D. Marine and E. J. Baumann, New York.—p. 86.

*Relief of Experimental Ileus by Spinal Anesthesia. J. Markowitz and W. R. Campbell, Toronto.—p. 101.
Iris Movements in Blind Mice. C. E. Keeler, Paris.—p. 107.
Variations of pH of Blood and Response of Vascular System to Epinephrine. G. E. Burget and M. B. Visscher, Chicago.—p. 113.
Capillary Permeability: I. Factors in Production of Capillary Stasis. E. M. Landis, Woods Hole, Mass.—p. 124.
Augmented Salivary Secretion. B. P. Babkin and P. D. McLarren, Halifax, N. S.—p. 143.
*Splanchnic Nerve as Secretory Nerve of Gastric Glands. G. W. Volborth and N. N. Kudryavzeff, Leningrad, Russia.—p. 154.
*Sudden, Transitory Reduction in Viscosity of Blood as Cause of Fall in Blood Pressure in Shock. R. A. Waud, London, Ont.—p. 160.
*Mechanism of Respiratory Waves in Systemic Arterial Blood Pressure. P. Heinbecker, St. Louis.—p. 170.
Comparison of Blood Pressure, Kidney Volume and Pancreatic Secretory Response Following Vein Administration of Secretin Preparations. O. W. Barlow, Chicago.—p. 182.
*Influence of Sodium Nitrite, Peptone and Pilocarpine on External Secretion of Pancreas. O. W. Barlow, Chicago.—p. 189.
Adjustment of Heart Rate and Arterial Pressure in Healthy Young Women During Prolonged Standing. A. H. Turner, Boston.—p. 197.
*Effect of Turnips and Turnip Juice on Blood Sugar, Phosphorus and Cholesterol of Rabbits. A. A. Horvath, Peking, China.—p. 215.
Regulation of Respiration: VIII. pH of Arterial Blood and Respiration Volume Changes. F. W. Bald, Ann Arbor, Mich.—p. 222.
Function of Frog's Kidney. M. M. Crane, Baltimore.—p. 232.
Kidney Function in Suprarenal Insufficiency. F. A. Hartman, C. G. MacArthur, F. D. Gunn, W. E. Hartman and J. J. MacDonald, New York.—p. 244.

**Result of Feeding Fresh Anterior Pituitary to Hypophysectomized Rat.**—Smith states that the daily feeding of two fresh bovine anterior pituitary glands does not cause any increase in the body weight, or in the tail or body length of the hypophysectomized rat. The growth curves of animals thus treated parallel those of the operated rat receiving an equal amount of muscle as a control substance. This anterior pituitary feeding also fails to restore, in the slightest degree, the atrophied genital system, thyroids or suprarenal cortex of the hypophysectomized rat.

**Effect of Pituitary Extract on Carbohydrate Metabolism.**—In the experiments reported on by Hines et al. the administration of pituitary extract in doses of approximately 0.05 cc. per kilogram of body weight per hour, together with dextrose by the continuous intravenous method, resulted in a decreased retention of the injected sugar by the tissues of the dog early in the course of the experiment and did not appear to be more pronounced at the end of the period. It is suggested that an altered capillary circulation may be an important factor in the mechanism of pituitary action.

**Relation of Spleen to Methemoglobin.**—Experiments made by Ray and Stimson show that the spleen plays some part in preventing the formation and hastening the removal of a nonoxygen bearing blood pigment formed by the action of nitrobenzene. This pigment, in view of spectroscopic examinations, the authors have considered to be methemoglobin. They suggested that the splenic functions of acting as a blood reservoir and stimulating red cell formation are of less importance in this particular reaction than the function of blood destruction. Finally, they have postulated another function, that of active reduction of methemoglobin to hemoglobin.

**Chlorides of Sweat, Urine and Blood.**—A simultaneous study of the constituents of the sweat, urine and blood has been made by Talbert and Haugen. Fluctuations in the chlorides were noted. There was no evidence of correlation between the sweat and urine chlorides, but considerably more evidence of a correlation between the blood and sweat chlorides.

**Nitrogen of Sweat, Urine and Blood.**—The variations in the total nitrogen of the sweat and urine, as well as the total nonprotein nitrogen of the blood filtrate, were noted by Talbert et al. Barney's contention that the total nitrogen per hundred cubic centimeters of sweat is more than double that of the total nonprotein nitrogen of the blood was confirmed in most instances. Only a slight correlation was noted in the total nitrogen of the sweat and urine. Some correlation was noted between the total nitrogen of the sweat and the total nonprotein nitrogen of the blood. No correlation was noted between the chlorides and the total nitrogen of the sweat.

**Duration of Life After Suprarenalectomy.**—Data on 101 experiments are given by Marine and Baumann. Control cats from which both suprarenals have been removed at one operation have survived on an average of five and three-tenths days. The administration of physiologic sodium chloride solution, Ringer's solution and isotonic sodium acetate solution have increased the duration of life about three times that of the controls. More concentrated solutions of sodium chloride definitely shorten life. Isotonic glucose and glycerol solutions have only a very slight life prolonging effect. It is concluded from these studies that diuresis is one of the important factors determining the duration of life. When the loss of water by diuresis is compensated for by an additional intake, life is prolonged, and if not, life is shortened. There is some indication that the loss of sodium is more specific than can be accounted for as a result of a possible acidosis. It is believed that all the manifestations of suprarenalectomy thus far observed are the individual details of a more fundamental and as yet unknown disturbance in nutrition in which the sympathetic nervous system is primarily concerned.

**Spinal Anesthesia Abolishes Paralytic Ileus.**—The conception of paralytic ileus as a reflex inhibition of bowel movements which can be abolished by spinal anesthesia is advanced by Markowitz and Campbell.

**Splanchnic Nerves Are Secretory for Stomach.**—Several forms of experiments were devised by Volborth and Kudryavzeff by which it was demonstrated that the splanchnic nerves contain secretory fibers for the gastric glands.

**Viscosity of Blood in Shock.**—The theory is advanced by Waud that the fall in blood pressure in anaphylactic shock and allied conditions is brought about by a sudden transitory reduction in the viscosity of the blood. The reduction in viscosity causes the fall in blood pressure because of the fact that the less viscid blood passes through the small arterioles more readily, and thus the pressure and blood volume in the capillaries is suddenly increased. The results of a series of experiments are reported in which viscosity determinations were made before and following the injection of peptone, histamine or antigen. These experiments support the foregoing theory. It was also noted that following the decrease in viscosity, and accompanying the symptoms of bronchial constriction in the anaphylactic dog, there was a marked increase in the viscosity of the blood. It is suggested that this increase in viscosity extends to the muscle plasma and may be associated with the muscular contraction in the bronchi. A reduction in the viscosity of the limiting membrane of the endothelial cells of the capillaries is mentioned as a probable contributing factor in the production of the edema in "shock."

**Mechanism of Respiratory Waves.**—Experimental evidence is produced by Heinbecker to show that pulmonary resistance is diminished and vascular capacity increased during inflation of the lungs. On deflation of the lungs pulmonary resistance is increased while the vascular capacity is diminished. The opposite conditions hold in lungs inflated by positive pressure. It is shown that in man the respiratory waves in systemic arterial blood pressure consist of an immediate fall on inspiration and an immediate rise on expiration. These facts are adequately explained on the basis of passive changes occuring in the capacity of the vascular bed of the lungs during respiratory phases.

**Pilocarpine Is Secretagogue.**—The general and splanchnic vascular changes have been correlated by Barlow with the pancreatic secretory rate following the administration of pilocarpine. Further proof of the mechanism of the pilocarpine secretagogue action is presented.

**Turnip Juice in Cholelithiasis.**—The capacity of the turnip to affect the metabolism of cholesterol, Horvath thinks, may throw some light on the curative effect of the turnip juice in cholelithiasis. Turnip juice contains a thermostable substance which, injected subcutaneously, produces hyperglycemia in rabbits. Subcutaneous injections in rabbits of raw turnip juice are followed by a decrease in the inorganic blood

phosphates, while boiled turnip juice results in a rise. Subcutaneous injections of raw turnip juice or the feeding of raw turnips produce a fall in the cholesterol content of the blood.

## American J. Roentgenol. & Rad. Therapy, New York

**17:** 611-714 (June) 1927

Relation of Chemical, Colloidal and Biologic Effects of Roentgen Rays of Different Wave Lengths to Ionization Which They Produce in Air: I. Action on Solutions of Oxyhemoglobin in Water. H. Fricke and B. W. Petersen, Cleveland.—p. 611.
Skin Erythema Dose with Combination of Two Types of Radiation. E. H. Quimby, New York.—p. 621.
*Diabetic Tuberculosis. M. C. Sosman and J. H. Steidl, Boston.—p. 625.
*Saucer Deformity of Diaphragm. W. S. Middleton, Madison, Wis.—p. 630.
Case of Osgood-Schlatter's Disease. K. T. Meyer, Evansville, Ind.—p. 634.
Radium Capsules in Stomach: Gastroscopic Removal. L. H. Clerf, Philadelphia.—p. 635.
Fundamental Problems in Radiation Treatment of Cancer of Esophagus. J. M. Marcus, New York.—p. 637.
*Lymphoblastoma (Hodgkin's Disease) of Orbit. R. J. Reeves, New York.—p. 642.
"Grenz" (Infraroentgen) Ray Therapy. G. Bucky, New York.—p. 645.
New Methods in Roentgenography. W. Altschul, Prague, Czechoslovakia.—p. 659.
Apparatus for Making Roentgen-Ray Dosage Measurements. H. Clark, New York.—p. 667.

**Diabetes Complicating Tuberculosis.**—Sosman and Steidl found pulmonary tuberculosis complicating diabetes in 9 per cent of 182 patients who had routine roentgen-ray examinations of the chest. The pulmonary tuberculosis was frequently of the hilum or unsensitized form in 46 per cent of forty-five cases, and occurred most frequently in patients past 45 years of age. The prognosis was uniformly poor, even with insulin.

**Saucer Deformity of Diaphragm.**—An elevated, saucer-like deformity of the diaphragm has been found to occur independent of costophrenic synechiae in conditions other than subphrenic abscess. It is suggested by Middleton that certain of these cases may represent an exaggerated tenting coupled with partial inhibition, such as occurs in practically all pulmonary infiltrations. Another group would seem, by a preservation of movement in the mesial portion of the dome with fixation lateral to the angulation, to depend on a segmentary inhibition. A ready explanation would seem to lie in the reputed dual motor innervation of the diaphragm. For the dog no such innervation could be established, nor was there produced experimentally a saucer deformity.

**Lymphoblastoma.**—Five cases of lymphoblastoma about the orbit, without other clinical observations, are reported by Reeves. The prognosis of these cases is much more favorable than those showing generalized lymphadenopathy. The extrabulbar tumors have a tendency to remain localized, and only one of these patients developed generalized lymphadenopathy after the initial conditions in the orbit. Treatment consisted of radiotherapy.

## Boston Medical and Surgical Journal

**196:** 893-932 (June 2) 1927

*Loss of Chloride and Water from Tissues and Blood in Acute High Intestinal Obstruction. J. C. White and E. M. Bridge, Boston.—p. 893.
*Appendicitis. H. K. Tuttle, Ancon, C. Z.—p. 897.
"Backache in Women" from Standpoint of Gynecologist. A. K. Paine, Boston.—p. 902.
Livestock Diseases Affecting Public Health. J. A. Kierman, Washington, D. C.—p. 907.

**Loss of Chloride and Water in Duodenal Obstruction.**—As the fall of chloride in the tissues parallels that in the blood, and as the loss of chloride from the blood and tissues corresponds with the total amount lost through all channels of elimination, White and Bridge state that only the administration of both chloride and water can prevent a fatal alteration in the chemical equilibrium of the blood and tissues.

**Appendicitis.**—There were fifty-six deaths among the 3,285 cases analyzed by Tuttle. Peritonitis was the cause of thirty-six of the deaths, and septicemia of eight. In 1925, the death rate from appendicitis was 1.4 per cent. Acute intestinal obstruction was a relatively rare sequel in this series, and was noted almost entirely in clean cases. Postoperative adhesions were also most frequently seen in cases in which there had not been previous drainage.

## Endocrinology, Los Angeles

**11:** 97-160 (March-April) 1927

Endocrine Factors in Vigor: XVI. R. G. Hoskins, Columbus, Ohio.—p. 97.
*Psychic Trauma in Pathogenesis of Exophthalmic Goiter. I. Bram, Philadelphia.—p. 106.
Thyroid Apparatus: XLVIII. Age, Sex, Weight and Season as Lethal Factors in Parathyroid and Thyroid Deficiency. F. S. Hammett, Philadelphia.—p. 117.
Action of Ultraviolet Rays, Thyroid and Parathyroid Substances on Artificial Plasma in Vitro. H. W. C. Vines, Cambridge, England.—p. 125.
Vigor: Thyroid Administration in Senility: XII. R. G. Hoskins, Columbus, Ohio.—p. 136.
Id.: XIII. Effect of Early Castration on Voluntary Activity of Male Albino Rats. H. M. Gans, Columbus, Ohio.—p. 141.
Id. Effect of Fractional Castratio non Voluntary Activity of Male Albino Rats. H. M. Gans, Columbus, Ohio.—p. 145.

**Psychic Trauma in Pathogenesis of Exophthalmic Goiter.**—In a series of 3,343 cases of exophthalmic goiter reviewed by Bram, 2,842, or 85 per cent, presented a clear history of psychic trauma as the exciting cause of the disease. In 107 cases, there was elicited a history of general or focal infection as the probable exciting cause of the disease. In 133 cases, the ingestion of iodine or of thyroid extract in tablets or in the form of obesity "cures" was regarded by the patients as the cause of the symptoms. In 201 cases there was no discoverable exciting cause to account for the onset of the disease.

## Florida Med. Assoc. Journal, Jacksonville

**13:** 278-299 (June) 1927

Surgical Treatment of Bile Tract. E. S. Judd, Rochester, Minn.—p. 278.
"Deep Roentgen-Ray Therapy." H. B. McEuen, Jacksonville.—p. 281.
Rationale of Roentgen-Ray Therapy in Dermatology. E. D. French, Miami.—p. 286.
Vomiting in Pregnancy. H. L. Pearson, Miami.—p. 289.
Red Urine. J. A. Mease, Jr., Dunedin.—p. 291.
Kidney and Bladder Stone. G. F. Highsmith, Arcadia.—p. 292.

## Georgia Medical Association Journal, Atlanta

**16:** 187-222 (June) 1927

Scarlet Fever in Georgia School for Deaf. B. V. Elmore, Rome.—p. 192.
Serums and Serum Reactions. J. W. Simmons, Brunswick.—p. 194.
Roentgen-Ray Evidences of Gallbladder Disease. A. A. Rayle, Athens.—p. 199.
Wassermann Reaction and Diagnosis of Syphilis. W. F. Reavis, Waycross.—p. 203.
The Doctor's Wife. W. C. McCarver, Vidette.—p. 205.

## Journal of Biological Chemistry, Baltimore

**73:** 371-795 (June) 1927

Iso-Electric Precipitation of Pepsin. F. Fenger and R. H. Andrew, Chicago.—p. 371.
Absence of Stratification and Rapidity of Mixing of Carbon Dioxide in Air Samples. T. M. Carpenter and E. L. Fox, Boston.—p. 379.
*Influence of Intense Roentgen-Ray and Gamma-Ray Radiation on Cholesterol. M. C. Reinhard and K. W. Buchwald, Buffalo.—p. 383.
Acid- and Base-Forming Elements in Foods. G. W. Clark, Berkeley, Calif.—p. 389.
Factors Involved in Reaction Changes of Human Saliva. G. W. Clark and K. L. Carter, Berkeley, Calif.—p. 391.
Nutrient Ions of Plants and Ion Activation of Plant Enzymes. G. Doby, East Lansing, Mich., and R. P. Hibbard, Budapest, Hungary.—p. 405.
*Intermediary Carbohydrate Metabolism: II. Ketosis in Phlorhizin Diabetes. M. Wierzuchowski, New York.—p. 417.
*Id.: III. Vital Action of Glucose in Phlorhizin Diabetes. M. Wierzuchowski, New York.—p. 445.
Diffusion of Water Into Lecithin-Collodion Membranes. H. A. Abramson and S. H. Gray, New York.—p. 459.
Lactic Acid Formation in Muscle Extract. H. A. Davenport and M. Cotonio, St. Louis.—p. 463.
*Effect of Parathyroid Extract on Normal Calves. C. S. Robinson, C. F. Huffman and K. L. Burt, East Lansing, Mich.—p. 477.
*Existence of Two Active Factors in Vitamin B Complex. W. D. Salmon, Auburn, Ala.—p. 483.
Determination of Respiratory Quotient of Small Animals. L. G. Wesson, Nashville, Tenn.—p. 499.
*Fat Formation Under Abnormal Conditions from Carbohydrate by Rat: Relationship to New Dietary Factor. L. G. Wesson, Nashville, Tenn.—p. 507.

Indole Derivatives in Diet Deficient in Tryptophane. R. W. Jackson, Louisville, Ky.—p. 523.
Metabolism of Sulphur: XII. Value of Diglycyl-Cystine, Dialanyl-Cystine, and Dialanyl-Cystine Dianhydride for Nutritive Requirements of White Rat. G. T. Lewis and H. B. Lewis, Ann Arbor, Mich.—p. 535.
Cystine Content of Hair and Other Epidermal Tissues. R. H. Wilson and H. B. Lewis, Ann Arbor, Mich.—p. 543.
*Fate of Sugar in Animal Body: VI. Sugar Oxidation and Glycogen Formation in Normal and Insulinized Rats During Absorption of Fructose. G. T. Cori and C. F. Cori, Buffalo.—p. 555.
*Human Red Blood Cell Permeability. A. M. Wakeman, A. J. Eisenman and J. P. Peters, New Haven, Conn.—p. 567.
Behavior of Prolamins in Mixed Solvents: III. Denaturation of Wheat Gliadin. M. J. Gottenberg and C. L. Alsberg, Stanford University, Calif.—p. 581.
Adsorption of Carotin by Different Charcoals and Inorganic Salts. S. G. Willimott, Cambridge, England.—p. 587.
Nucleotides of Triticonucleic Acid. H. O. Calvery and D. B. Remsen, Baltimore.—p. 593.
Pentose Metabolism: II. Micromethod for Determination of Pentoses and Pentosans. G. E. Youngburg, Buffalo.—p. 599.
Sulphur Metabolism. C. P. Sherwin, G. J. Shiple and A. R. Rose, New York.—p. 607.
*Antirachitic and Calcifying Properties of Summer and Winter-Produced Dry Milk, Irradiated and Nonirradiated. G. C. Supplee and O. D. Dow, New York.—p. 617.
Distribution of Nonprotein Sulphur of Blood Between Serum and Corpuscles. L. Reed and W. Denis, New Orleans.—p. 623.
Tyrosine and Tryptophan Determinations in Proteins. O. Folin and V. Ciocalteu, Boston.—p. 627.
Titration Curves of Taurine and of Cystic Acid. S. Andrews and C. L. A. Schmidt, Berkeley, Calif.—p. 651.
*Rickets in Rats: I. High Calcium Low Phosphorus Diets. S. Karelitz and A. T. Shohl, New Haven, Conn.—p. 655.
*Id.: II. Effect of Phosphate Added to Diet. S. Karelitz and A. T. Shohl, New Haven, Conn.—p. 665.
Influence of Solvent and of Concentration on Optical Rotation of Pentacetates of Glucose and Mannose. P. A. Levene and I. Bencowitz, New York.—p. 679.
Determination of Urea by Gasometric Measurement of Carbon Dioxide Formed by Action of Urease. D. D. Van Slyke, New York.—p. 695.
*Effect of Insulin on Respiratory Exchange of Fed and Fasting Rabbits. I. L. Chaikoff and J. J. R. Macleod, Toronto.—p. 725.
*Blood as Physicochemical System: V. Composition and Respiratory Exchanges of Normal Human Blood During Work. A. V. Bock et al., Boston.—p. 749.
*Relation of Connective Tissue Content of Meat to Its Protein Value in Nutrition. H. H. Mitchell, J. R. Beadles and J. H. Kruger, Urbana, Ill.—p. 767.

**Effect of Roentgen Ray and Gamma Ray on Cholesterol.**—Reinhard and Buchwald show that roentgen-ray and gamma-ray irradiation produce a definite chemical change in the cholesterol dissolved in chloroform or in absolute alcohol. That part of the molecule which is responsible for the ultraviolet absorption and for the chemical reaction is changed more than the part which is optically active.

**Ketosis in Phlorhizin Diabetes.**—On the basis of his experimental results, Wierzuchowski asserts that in completely phlorhizinized dogs, after the ingestion of dextrose, small amounts of it are oxidized, a fact which has never been proved conclusively so far.

**Action of Dextrose in Phlorhizin Diabetes.**—In six out of sixteen phlorhizinized dogs, convulsions have been observed by Wierzuchowski at the point at which they apparently presented symptoms of the most severe form of diabetes. Dextrose administered by mouth was successful in relieving convulsions (if the symptoms were not of too long standing) as long as the blood sugar was above the preliminary level. Convulsions commonly returned as soon as the blood sugar dropped below the preliminary level. The ingestion of a sufficient quantity of dextrose was followed by a transitory disappearance of the clinical symptoms of ketosis and coma, when ketone bodies disappeared from the urine and breath.

**Effect of Parathyroid Extract on Normal Calves.**—Robinson, Huffman and Burt report that injection of a potent extract of parathyroid into calves produced a marked increase in the blood calcium. If sufficient extracts were administered, a maximum of 18 mg. per hundred cubic centimeters was reached in about thirty hours after the first injection. Increasing the dose of extract failed to raise the blood calcium above this value. There was a decrease in inorganic phosphorus of the blood.

**Active Factors in Vitamin B Complex.**—Comparative tests made by Salmon on seed of the velvet bean and the soy bean, and on leaves of the velvet bean and of rape, have shown a higher antineuritic or beriberi-preventing value for the seeds than for the leaves. Tests have shown the leaves to be more potent than the seeds in their growth-promoting action. The results have been interpreted as indicating further that the so-called vitamin B is a complex containing two or more active substances. It is suggested that the term vitamin B be retained to designate the complex. It is also suggested that the specific factor which prevents polyneuritis or experimental beriberi be designated as vitamin B-P, or the beriberi-preventing factor.

**Fat Formation from Carbohydrate.**—Rats that were fed a restricted diet over a period of weeks were found by Wesson to give respiratory quotients as high as 2 or more during the assimilation of a carbohydrate meal, indicating the conversion of a portion of the carbohydrate to fat. When the restricted diet was modified so as to include casein, rolled oats, calcium carbonate and sodium chloride, high respiratory quotients, and thus probably fat formation, were still obtained during the assimilation of a carbohydrate feeding. If a small amount of lard or certain other hog fats were fed to rats which exhibited this abnormal conversion of carbohydrate to fat, normal assimilative respiratory quotients were obtained.

**Insulin and Fructose Oxidation.**—Rats fasted previously for forty-eight hours use less oxygen and, after sugar feeding, absorb less fructose and oxidize less fructose than twenty-four hour fasting rats. It is concluded by the Coris that a surplus of insulin leads to an increased oxidation of fructose.

**Red Blood Cell Permeability.**—The experiments made by Wakeman et al. indicate an impermeability of the red blood cell to the cations sodium and potassium. No explanation is offered for the extraordinary distribution of potassium and sodium between the cells and their surrounding fluid, for the cell membrane is apparently equally impervious to both of these cations.

**Antirachitic Properties of Dry Milk.**—Summer-produced and winter-produced dry milk, made by the Just double cylinder process, when tested by Supplee and Dow for antirachitic and calcifying properties, under identical conditions showed that the summer-produced milk possessed greater antirachitic and calcifying properties than the winter-produced milk. Irradiation of the summer and winter-produced dry milk imparted measurably greater antirachitic and calcifying properties to both products. A greater increment of increase in calcifying properties was imparted to the winter-produced milk than there was to the summer-produced milk.

**Metabolism of Rickets.**—On a diet high in calcium, low in phosphorus and deficient in vitamin D, by which rickets is produced, the calcium and phosphorus balances were both positive. The calcium retention was found by Karelitz and Shohl to be 50 per cent of the normal, and the phosphorus was only 20 per cent of the normal, thus resulting in an excess proportion retained of calcium to phosphorus.

**Effect of Added Phosphate in Rickets Diet.**—The addition of phosphate to a rickets-producing diet of high calcium low phosphorus content, with vitamin and light factors unchanged, so as to bring the ratio of calcium : phosphorus = 1 : 1, causes a rapid healing of rickets in rats. The changes are from rickets toward tetany with extremely high phosphorus and low calcium in the serum. The metaphyses show more rapid calcium phosphate deposition by this method than by any other method of curing rickets in rats. The bones show small increases in the percentage of calcium.

**Effect of Insulin on Respiratory Exchange.**—The results of the experiments made by Chaikoff and Macleod confirm those originally obtained in their laboratory to the effect that the injection of subconvulsive doses of insulin into rabbits causes either no change or only a relatively slight increase in the oxidation of carbohydrates.

**Physicochemical Properties of Blood.**—Bock et al. give a description of the principal physicochemical properties of the

blood of a normal man in a steady state of work, and of the changes in the blood accompanying the change from rest to work.

**Protein Value of Meat.**—The biologic value of the nitrogen of pork tenderloin, containing a minimal amount of connective tissue, was found by Mitchell et al. to be 79. That of pork cracklings, consisting largely of connective tissue, was found to be 25. When the two materials were mixed in the proportion of three parts of tenderloin nitrogen to one part of cracklings nitrogen, a distinct depression of the biologic value of the tenderloin nitrogen was observed, the mixture possessing a value of 72. Reasons are given for believing that cuts of beef varying widely in their content of connective tissue would also vary widely in the biologic values of their nitrogen, so that the less desirable cuts, containing large amounts of connective tissue, would be distinctly less valuable as sources of protein for maintenance and growth. This is not so true of pork, since different cuts of pork do not seem to vary greatly in their content of connective tissue.

## Journal of Comparative Neurology, Philadelphia

**43:** 201-356 (June 15) 1927

Postnatal Growth in Area of Optic Nerve in Albino and Gray Norway Rats. C. C. Wang, Philadelphia.—p. 201.
Nictitating Membrane and Superior Cervical Ganglion in Rabbit. P. C. Bucy, Iowa City.—p. 221.
Amphibian Forebrain: IV. Cerebral Hemispheres of Amblystoma. C. J. Herrick, Chicago.—p. 231.
Neurofibrillar Structure of Giant Fibers in Lumbricus Terrestris and Eisenia Foetida. W. M. Smallwood and M. T. Holmes, New York.—p. 327.
Experimental Proof of Types of Neurons That Innervate Tooth Pulp. W. F. Windle, Chicago.—p. 347.

## Journal of Experimental Medicine, Baltimore

**45:** 937-1125 (June 1) 1927

Bacterial Enzymes: IV. Maltase and Lipase of Botulinus Bacillus. J. M. Neill and W. L. Fleming, Nashville, Tenn.—p. 937.
Id.: V. Carbohydrases and Lipase of Welch Bacillus. W. L. Fleming and J. M. Neill, Nashville, Tenn.—p. 947.
*Nuclear Inclusions Produced by Varicella Virus in Testes of Monkeys. T. M. Rivers, New York.—p. 961.
Virus of Vesicular Stomatitis of Horses: Foot and Mouth Disease. P. K. Olitsky, New York.—p. 969.
*Influence of Ovariectomy on Spontaneous Occurrence of Mammary Carcinomas in Mice. C. F. Cori, Buffalo.—p. 983.
Growth Requirements of Hemophilic Bacilli. F. C. O. Valentine and T. M. Rivers, New York.—p. 993.
Isolation of Pure Cultures from Single Bacterial Cells. R. C. Avery and S. J. Leland, Nashville, Tenn.—p. 1003.
Cultivation of Lens Epithelium in Vitro. D. B. Kirby, New York.—p. 1009.
Action of Sympathetic on Excitatory Process in Mammalian Heart. E. C. Andrus and L. E. Martin, Baltimore.—p. 1017.
*Experimental Epidemiology of Tuberculosis. D. Perla, Philadelphia.—p. 1025.
Bacteriophage Isolated from Common House Fly (Musca Domestica). R. E. Shope, Princeton, N. J.—p. 1037.
Influence of Acid Groups on Serologic Specificity of Azoproteins. K. Landsteiner and J. van der Scheer, New York.—p. 1045.
Development of Agglutinins and Protective Antibodies in Rabbits Following Inhalation of Pnumococci. E. G. Stillman, New York.—p. 1057.
Comparison of Effects Produced by Partial Obstruction in Inspiratory and Expiratory Phases of Respiration. R. L. Moore and C. A. L. Binger, New York.—p. 1065.
*Blood Reaction and Blood Gases in Pneumonia. C. A. L. Binger, A. B. Hastings and J. Sendroy de, New York.—p. 1081 (Type III): II. Infectivity for Rabbits. W. S. Tillett, New York. Immunity to Pneumococcus Mucosus.—p. 1093.

**Experimental Varicella in Animals.**—The evidence presented by Rivers is said to be the only definite record that experimental animals are susceptible in any way to the action of varicella virus. Eosin-staining nuclear inclusions found in the testes of monkeys inoculated with emulsified tissue of human chickenpox lesions were specifically associated with the virus of varicella.

**Effect of Ovariectomy on Occurrence of Mammary Carcinoma.**—Castration of female mice, between 15 and 22 days of age, entirely prevented the occurrence of spontaneous adenocarcinoma of the breast, while the nonbreeding control mice of the same strain showed a tumor incidence of 78.5 per cent. Three of the spayed animals developed a spontaneous spindle cell sarcoma. Cori asserts that this indicates that the influence of the ovary on the development of breast carcinomas is a specific one, since ovariectomy does not lead to a resistance against other types of spontaneous tumors. It is concluded that the spontaneous mammary carcinoma of the mouse is due to a hereditary organ disposition, which remains latent in the absence of ovarian function, but which becomes manifest when a certain amount of ovarian hormone, corresponding to from five to thirty estrus cycles, has acted on the breast tissue.

**Experimental Epidemiology of Tuberculosis.**—After intraperitoneal inoculation of guinea-pigs with tubercle bacilli, Perla says that the micro-organisms may appear in the feces and elimination may persist during one week. Subsequently, during several weeks, tubercle bacilli cannot be recovered from the feces. When tuberculosis is widely disseminated in the body of guinea-pigs, tubercle bacilli are discharged with the feces. Tubercle bacilli are occasionally eliminated in the bile of guinea-pigs immediately after inoculation but are almost constantly found in the bile after several weeks when the disease is well established. Tubercle bacilli are eliminated in the urine of experimentally infected guinea-pigs only when infection is far advanced.

**Blood Reaction and Blood Gases in Pneumonia.**—Estimation by Hastings and Sendroy of the blood reaction and of the blood gases in a series of nineteen individuals suffering from pneumonia failed to reveal a condition of acidosis occurring at any time during the disease.

## Journal of Preventive Medicine, Baltimore

**1:** 343-400 (May) 1927

*Precipitin Test in Malaria. W. H. Taliaferro, L. G. Taliaferro and A. B. Fisher, Chicago.—p. 343.
*Typhoid in Alabama. L. C. Havens and S. A. Dehler, Montgomery, Ala.—p. 359.
Preventive Medicine in Student Health Service. H. S. Diehl, Minneapolis.—p. 377.
*Analysis of Infant Mortality by Causes. H. W. Green, Cleveland.—p. 391.

**Precipitin Test in Malaria.**—In a series of 1,605 precipitin tests made by the Taliaferros and Fisher on the serums of 535 persons (295 with malarial parasites in the peripheral blood, 174 negative and sixty-six doubtful) with thirty-seven different antigens, the best antigen was prepared from a heavily infected placenta by mincing in a meat chopper, extracting with ether, digesting the ether insoluble portion in the slightly alkaline solution of coca and using the clear filtrate as the antigen. When the serums from fifty-four infected persons were tested, forty-five gave a positive test (10 + + +, 21 + +, 14 +) and two a doubtful positive; seven were negative. When the serums of thirty-two persons showing a negative thick film for malaria were tested against the antigens, six gave a positive test (2 + +, 4 +) and one a doubtful positive; twenty-five were negative. Some results indicate that efficient antigens can be prepared from infected red blood cells provided they have a preliminary extraction with ether. All of the data indicate that the precipitation is a specific antigen-antibody reaction and not a nonspecific flocculation.

**Typhoid in Alabama.**—The examination of 348 persons who gave a history of an attack of typhoid yielded thirty-three typhoid carriers (9.5 per cent). Seven paratyphoid A and five paratyphoid B carriers were also found. The importance of repeated examinations is emphasized by Havens and Dehler. Those individuals who had typhoid in childhood yielded approximately the same number of carriers as those attacked in adult life. The results of this survey suggest doubt that gradual spontaneous clearing up of the carrier condition ceases altogether, even years after the disease, although it is improbable that this is of practical significance. The examination of thirty-five persons in close contact with active cases of typhoid disclosed seven carriers, none of whom had had the disease. These carrier studies further suggest that a correlation may be established between the number of healthy carriers and the incidence of the disease in a given population.

**Decrease in Infant Mortality.**—Infant mortality has been greatly reduced during the past generation. Green shows

that the decrease in the number of deaths due to diarrhea and enteritis is largely responsible for this reduction. The death rate from premature birth has steadily increased during the past generation, until now it has replaced diarrhea and enteritis as the most important cause of infant mortality.

## Journal of Urology, Baltimore

**17:** 525-602 (June) 1927

Regional Anesthesia for Operations on Urinary Bladder. J. S. Lundy, Rochester, Minn.—p. 525.
*Intrascrotal Lipoma. A. B. Cecil, Los Angeles.—p. 557.
*Tuberculosis of Genital Tract Treated with Tuberculin. W. J. Ezickson, Philadelphia.—p. 567.
*New Stain Technic for Tubercle Bacilli. C. F. Elvers, Baltimore.—p. 573.
Comparative Histology of Urethral Mucosa: Relation to Gonococcal Infections. E. W. Hirsch, Chicago.—p. 575.
Effects of Temperature on Viability of Gonococcus. F. S. Schofield, Philadelphia.—p. 581.

**Intrascrotal Lipoma.**—The tumor in Cecil's case rested on the testis, but was outside the tunica vaginalis. Apparently, it originated in or immediately adjacent to the spermatic cord, and separated in its growth the different structures of the cord. The testis was somewhat smaller than normal, but otherwise appeared to be of normal structure. No fat was found within the testis itself.

**Use of Tuberculin in Genital Tract Tuberculosis.**—Ezickson commends the use of tuberculin in tuberculosis of urogenital tract. Good results are reported in the three cases cited.

**New Stain Technic for Tubercle Bacillus.**—The formula presented by Elvers is said to permit the so-called acid-fast organisms to be stained without the application of heat. The film on the glass slide is made in the usual way, fixed by heat, and placed for five minutes in a Coplin jar containing the following stain: absolute alcohol, 20 cc.; melted phenol crystals, 20 cc.; basic fuchsin, 12 Gm.; xylene (C. P.), 90 cc. Decolorization is effected by gently rinsing in 0.25 per cent acid alcohol. Then the slide is rinsed for a few seconds in distilled water, air dried and counterstained with Loeffler's methylene blue. The acid-fast bacilli are stained red by the fuchsin; the other organisms and cells are blue.

## Laryngoscope, St. Louis

**37:** 393-472 (June) 1927

Philosophy of Older Tests of Hearing. R. Sonnenschein, Chicago.—p. 393.
Management of Internal Ear Infections: Six Cases. J. M. Smith, New York.—p. 417.
Diagnosis of Sinus Thrombosis. R. Ottenberg, New York.—p. 424.
Jugular Bulb Thrombosis, Multiple Abscesses: Recovery. F. C. McDaniel, New York.—p. 428.
Bucco-Antral Fistula: Closure by Plastic Procedure. I. W. Voorhees, New York.—p. 431.
Tumor of Carotid Body. J. E. Sheehan and M. Rabiner, New York.—p. 433.
Otitic Meningitis Running Prolonged Course. S. Rosen, New York.—p. 437.
Primary Jugular Bulb Thrombosis Presenting Unusual Features. J. Druss, New York.—p. 439.
Chronic Purulent Otitis Media: Complications. A. L. Usset, Chester, Pa.—p. 441.
Hemangioma of Tonsillar Fossa. G. B. Trible, Washington, D. C.—p. 444.
Vincent's Angina. L. R. Effler, Toledo, Ohio.—p. 448.
Traumatic Mastoiditis with Postoperative Signs Suggestive of Intracranial Complication. W. L. Horn, New York.—p. 453.
Operation for Epistaxis. G. E. Davis, New York.—p. 455.

## Maine Medical Association Journal, Portland

**18:** 105-120 (June) 1927

Malignant Disease of Esophagus: Seven Cases. G. O. Cummings, Portland.—p. 105.
Pierre Charles Alexandre Louis. W. E. Kershner, Bath.—p. 108.
Gastric Ulcer from Viewpoint of Surgeon. S. H. Kagan, Augusta.—p. 112.

## Medical Journal and Record, New York

**125:** 789-848 (June 15) 1927

Orthopedics in Sweden. E. D. Hauser, Rochester, Minn.—p. 789.
*Theory of Cancer Causation. E. McDonald, Philadelphia.—p. 795.
Cancer: XVIII. Predisposition: Increased Age. W. Meyer, New York.—p. 797. C'td.
*Foreign Protein Intravenously in General Paralysis. W. B. Jennings, Middletown, Conn.—p. 799.
Biliary Tract Disease Treatment by Exicol. B. Levinson, New York.—p. 801.
Vogue of Quackery. A. W. Meyer, San Francisco.—p. 804.
Therapeutic Uses of Radium Emanation: Cervical Cancer. J. Muir, New York.—p. 806.
Lyman Hall, Physician, Patriot, "Signer." H. Thoms, New Haven, Conn.—p. 808.
Treatment of Diabetes with Insulin. M. Labbé, Paris,—p. 811.
Lipemia Retinalis Diabetica. J. Ferber and I. Appermann, New York.—p. 815.
Frank's Synthalin in Diabetes Mellitus. M. Einhorn and H. A. Rafsky, New York.—p. 818.
Diabetes in Children. A. A. Levy, New York.—p. 820.
Analysis of Blood and Urine in Metabolic Disorders: Diabetes. H. Boucher, Vichy, France.—p. 823.

**Theory of Cancer Causation.**—A theory is suggested by McDonald that cancer is due to a cell reproduction favored by a certain optimum (for reproduction) increase of the univalent elements (such as sodium and potassium) over the bivalent elements (such as calcium and magnesium), and that this specific alkalinity and ionic association (for reproduction) produces such increase of permeability of the cell membrane and increase of conductivity as will favor cell division. It also suggested that radiation aids in the treatment of cancer by promoting an increased hydrogen ion concentration of the blood serum, and by stimulating the ionization of the bivalent substances (particularly calcium).

**Use of Typhoid Vaccine in General Paralysis.**—Out of a total of eighteen patients with general paralysis treated by Jennings at the Connecticut State Hospital with a solution of typhoid vaccine, ten appeared to make a good remission; five showed a slight improvement, and three did not show any improvement; there were no deaths in this series of cases. With the exception of herpes labialis, there were practically no complications, although one patient had a slight nosebleed (mucus slightly tinged with blood).

## New York State Journal of Medicine, New York

**27:** 641-706 (June 15) 1927

Polycystic Kidney: Case. J. L. Tenenbaum, New York.—p. 641.
Backache: From Orthopedic Standpoint. S. W. Boorstein, New York.—p. 644.
Regulation of Massage by New York City Department of Health. S. D. Hubbard, New York.—p. 650.
Private Practitioner and Preventive Medicine. E. H. Marsh, Albany.—p. 652.
Chronic Appendicitis: Clinical and Pathologic Study from Lenox Hill Hospital. R. C. Schleussner, New York.—p. 654.
Ninety-Nine Years Ago. J. Colegrove, New York.—p. 656.
Coincident Tubal and Uterine Pregnancy. A. J. Raggi, New York.—p. 658.

## Physical Therapeutics, Baltimore

**45:** 263-310 (June) 1927

Physical and Chemical Therapy of Neural Syphilis. C. Pope, Louisville, Ky.—p. 263.
Roentgen Rays, Radium, Endothermy and Other Physical Agents in Dermatology. J. J. Eller, New York.—p. 269.
Biology of Light in Dermatology. H. Goodman, New York.—p. 282.
Accidents from Electricity. S. Tousey, New York.—p. 293.
Treatment of Ankle and Foot Sprains. F. T. Woodbury, New York.—p. 304.

## Texas State Journal of Medicine, Fort Worth

**23:** 75-176 (June) 1927

Bit of Introspection. W. Keiller, Galveston.—p. 88.
The Past Year. E. V. DePew, San Antonio.—p. 91.
Value of Sunshine. O. Egbert, El Paso.—p. 93.
Advantages of Climate in Tuberculosis Hospitalization. M. A. W. Shockley, El Paso.—p. 95.

## Virginia Medical Monthly, Richmond

**54:** 135-202 (June) 1927

Developments in Public Health. R. W. Garnett, Danville.—p. 135.
Correction of Nasal Deformities. J. E. Sheehan, New York.—p. 138.
Importance of Vitamin Knowledge During Infancy and Childhood. W. A. McGee, Richmond.—p. 141.
Treatment of Tuberculosis. F. B. Stafford, Sanatorium.—p. 149.
Dyspepsias. E. Horgan, Washington, D. C.—p. 154.
Extraction of Teeth. H. Bear, Richmond.—p. 156.
Diabetes Mellitus: Two Cases. M. Lasersohn, Richmond.—p. 160.
Local Anesthesia in Nose and Throat. W. L. Gatewood, New York.—p. 163.
Internal Derangement of Knee. D. M. Faulkner, Richmond.—p. 166.
Fourth Fundamental Principle in Treatment of Tuberculosis. G. A. Ezekiel, Richmond.—p. 176.
Evolution of Medicine. G. A. Caton, New Bern, N. C.—p. 177.
Differentiation of Nontuberculous Pulmonary Infection from Tuberculosis. C. L. Harrell, Norfolk.—p. 181.
Ocular Findings of Importance to General Physicians and Surgeons. L. O. Mauldin, Greenville, S. C.—. 186.

## FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

### British Journal of Experimental Pathology, London

**8:** 149-266 (June) 1927

*Accentuating Pathogenic Organisms in Culture by Utilizing Inhibitory Influence of Whole Blood. M. Solis-Cohen.—p. 149.
*Effect of Extracts of Anterior Lobe of Pituitary on Liver. E. N. Chamberlain.—p. 155.
*Coccal Forms of Diphtheria Bacillus. H. J. Parish.—p. 162.
*Preservation of Herpes Virus. J. R. Perdrau.—p. 167.
*Standardization of Tuberculin. C. C. Okell and H. J. Parish.—p. 170.
*Action of Tumor Extracts on Tissues in Vitro. A. H. Drew.—p. 176.
Constitution of Dysentery Toxin: Relation to Testing of Antidysentery Serum. G. F. Petrie.—p. 183.
Action of Sulphonal on Rabbits. C. Polson.—p. 197.
Abnormal Material in Brains of Rabbits. C. Polson.—p. 205.
*Fate of Tubercle Bacilli Implanted in Human Plasma. R. G. Bannerman.—p. 209.
Development of Strains of Bacteria Resistant to Lysozyme Action and Relation of Lysozyme Action to Intracellular Digestion. A. Fleming and V. D. Allison.—p. 214.
Tetanus: III. Nontoxic Variants of B. Tetani. P. Fildes.—p. 219.
*Id.: IV. Geographic Incidence of Tetanus in England and Wales. M. Young.—p. 226.
*Blood Phosphorus in Health and Disease: I. H. D. Kay and F. B. Byrom.—p. 240.
*Specificity of Rous Sarcoma Virus as Tested by Experimental Embryoma in Chicken. L. W. Proger.—p. 253.
*Influence of Ferment Action on Infectivity of Rous Sarcoma. S. L. Baker and J. McIntosh.—p. 257.

**Accentuating Pathogens in Culture.**—Solis-Cohen points out that an organism which really is the etiologic factor may fail to grow, even when planted on a suitable culture medium, through having its growth inhibited by organisms that are nonpathogenic for the patient. Vaccine prepared from ordinary cultures, therefore, especially when consisting wholly or chiefly of the predominating organisms, may contain little or none of the required antigen, in which case it can have slight therapeutic value. It is doubtless because of this fact that supposedly specific vaccine therapy frequently fails. The patient's fresh, whole, coagulable blood is believed to possess bactericidal or bacteriostatic power against organisms that are nonpathogenic for him, and to lack it against organisms that are pathogenic for him. Its use, therefore, furnishes a means, other than the guess of the bacteriologist, of separating organisms that are infecting or capable of infecting the host from those of which he is merely a resistant carrier.

**Effect of Anterior Lobe of Pituitary on Liver.**—Injection of anterior lobe pituitary extracts gives rise to a group of striking histologic changes in the liver. Chamberlain states that the evidence available suggests that this change is dependent on the presence in the extract of some special active substance derived from the pituitary gland. It is argued that the change is a manifestation of increased functional activity of the liver, and that anterior lobe pituitary extracts may possibly be of value therapeutically. Nothing resembling this change has been obtained in the myocardium or the kidneys. Nothing similar to it could be obtained in rabbits by the injection of extracts of the posterior lobe of the pituitary, of insulin, or of bile salts, nor by thyroid feeding or injection with *B. sporogenes.*

**Coccal Forms of Diphtheria Bacillus.**—From time to time Parish has seen coccal forms in tryptic digest-broth cultures of *C. diphtheriae.* A culture of the "Park and Williams number 8" strain on a three days' tryptic digest of horse muscle at room temperature consisted almost entirely of coccal forms. A large number of coccal forms were also produced when recently isolated virulent and avirulent strains were sown in this broth. The coccal forms disappeared on the first subculture on Loeffler's medium, and on agar prepared with Witte peptone broth as its basis. They were still present in the fifth generation on agar prepared with digest broth, but had disappeared in the sixth. Typical bacillary forms were most readily induced on Loeffler's medium. Coccal forms are virulent and toxigenic. There is no evidence that they indicate racial degeneration of the organisms.

**Preservation of Herpes Virus.**—A method is described by Perdrau for the preservation of the virus of herpes which is economical in animals and time saving, and which should be capable of preserving the virulence of the strain over considerable periods of time by limiting the number of animal passages.

**Standardization of Tuberculin.**—Okell and Parish assert that the intradermic tuberculin test is more accurate than the subcutaneous or Pirquet methods, differences representing a 40 per cent drop being almost always detectable in a small series, and finer differences in a larger series of guinea-pigs. The test, however, calls for considerable experience.

**Action of Tumor Extracts on Tissue.**—The work of Heaton on the action of alcoholic yeast extracts on growth in tissue cultures is confirmed by Drew. Alcoholic extracts of transplantable mouse tumors prepared in the same way as the yeast extracts were without effect on growth. The watery extracts from transplantable tumors varied in activity according as they were prepared from tumors growing rapidly or from receding tumors.

**Fate of Tubercle Bacillus in Blood Plasma.**—The incorporation of a simple counting device in Wright's method of inculturing tubercle bacilli in human blood or plasma has enabled Bannerman to carry out quantitative experiments. The difficulty which arises from autolysis of plasma clots on incubation has been overcome by the use of nonalkaline glass. Working with an avian strain of *B. tuberculosis,* believed to be identical with that employed by A. E. Wright, Bannerman has confirmed the observation that tubercle bacilli grow better in normal plasma than in that of tuberculous subjects.

**Nontoxic Tetanus Bacilli.**—Confirmatory evidence was obtained by Young of the existence of nontoxic strains of *B. tetani* in soil or dung, and even in a case of tetanus. These strains are regarded as variants from the "ideal" tetanus bacillus.

**Blood Phosphorus in Health.**—The partition of phosphorus in the blood in thirty-one normal persons has been determined by Kay and Byrom, and the analytic methods used are critically discussed. The constancy of the ester phosphorus of the red cells in health has been demonstrated, and certain considerations arising out of the analytic data are presented.

**Specificity of Rous Sarcoma Virus.**—Proger found that embryonic structures survived in a rapidly growing Rous sarcoma somewhat longer than in normal muscle. Embryonic elements could be demonstrated in these mixed tumors after twenty-eight days, whereas in all cases in which embryo tissues alone were introduced, they had completely disappeared in fourteen days. When the embryo tissue tumor was reinoculated into another bird it rapidly disappeared, whereas reinoculation of the mixed Rous and embryo tumors produced a sarcoma in which no embryonic elements could be recognized. Retinal cells treated with "filtrate" produced a spindle cell sarcoma with small collections of pigment between tumor cells, some of which contained pigment granules in their cytoplasm. Reinoculation of the tumor produced a sarcoma in which pigment could not be found.

**Influence of Ferment Action on Sarcoma Infectivity.**—Baker and McIntosh state that the infectivity of filtrates of the Rous sarcoma is influenced by the factors which control ferment action, i. e., hydrogen ion concentration, ferment content, temperature and time; variations in any one of these factors may either greatly increase or entirely prevent tumor production.

### British Journal of Ophthalmology, London

**11:** 257-320 (June) 1927

Arthur Jacob, 1790-1874. R. R. James.—p. 257.
Movement of Intra-Ocular Fluid as Taught by Theodor Leber. P. Smith.—p. 263.
Visual Field Changes in Pregnancy. H. M. Traquair.—p. 271.
Complications Following 4,000 Cataract Extractions. M. M. Cruickshank.—p. 275.

### British Medical Journal, London

**1:** 1089-1134 (June 18) 1927

Treatment of Burns in Children. J. Fraser.—p. 1089.
Miners' Nystagmus. F. Fergus.—p. 1092.
Id.: F. Robson.—p. 1094.
*Acute Pancreatitis: Treatment by Drainage. R. G. Henderson.—p. 1095.
*Operation for Hallux Rigidus. W. A. Cochrane.—p. 1095.
*Spontaneous Rupture of Heart. C. J. Thomas and S. R. Tattersall.—p. 1096.

*Spontaneous Rupture of Right Ventricle of Heart. B. L. Hodge.—p. 1096.
*Treatment of Ringworm by Thallium Acetate. S. J. Firth.—p. 1097.
*Cardiac Failure Associated with New Growth in Chest. G. H. Pringle.—p. 1097.
Acute Lobar Pneumonia: Death in Nine and a Half Hours. R. I. Poston.—p. 1098.
Intestinal Obstruction Due to Torsion of Mesentery. A. N. Palit.—p. 1098.
Dissection of Tonsils. W. S. Kerr.—p. 1099.
Blood Transfusion in Hemorrhagic Disease of New-Born. M. Golding.—p. 1099.

**Drainage in Acute Pancreatitis.**—In three cases of acute pancreatitis, in all of which the patients recovered, Henderson opened the glandular tissue freely so as to drain the whole organ efficiently.

**Operation for Hallux Rigidus.**—In a case of osteoarthritis of the metatarsophalangeal joint, Cochrane made a longitudinal incision, 1 inch long, with its center over the level of the articulation, in the midline over the plantar aspect of the metatarsophalangeal joint of the great toe. The sheath of the flexor longus hallucis was incised in the line of the skin incision and the tendon hooked aside. A strong, narrow bladed knife was then passed into the joint to divide the capsule on its plantar aspect, along with the tendons of the small muscles attached to the base of the proximal phalanx. The plantar fibers of the lateral ligaments were also divided. Dorsiflexion, full and free, was obtained. The toe was bandaged in moderate dorsiflexion. Active and passive movements were begun on the third day. Full function was present by the time the stitches were removed, and full weight bearing was begun on that day.

**Spontaneous Rupture of Heart.**—In one of the two cases cited by Thomas and Tattersall, the rupture occurred in the right auricle posteriorly. The heart muscle was soft and flabby, and there was considerable sclerosis of the coronary arteries. In the other case the rupture occurred in the left ventricle posteriorly. The ventricular wall was diffusely affected by a gummatous condition. The coronary arteries were sclerosed, and in the aorta were patches of atheroma sharply limited to the points of origin of the intercostal arteries. A feature of interest was that the thymus had not undergone its usual atrophic changes, but extended downward as far as the base of the heart. The patient was 62.

**Spontaneous Rupture of Heart.**—In Hodge's case the right ventricle ruptured. The patient lived ten minutes after the rupture occurred.

**Thallium Acetate Treatment of Ringworm.**—The dose of thallium acetate given by Firth was ⅛ grain (8 mg.) per 2¼ pounds (1 Kg.) of body weight, irrespective of age. The drug is easily soluble, and is made up in sweetened water and administered in a single dose. Constitutional symptoms were not observed after the administration of the drug, even in the case of one child who received a second administration six weeks later. Local treatment was not applied to the scalp. The shedding of hair commenced between the fourteenth and sixteenth days. The hair could then easily be pulled out without causing any discomfort, and it also came off in the caps. The shedding was in every successful case complete in from three to six days.

**Cardiac Failure Caused by Lymphosarcoma.**—The tumor in Pringle's cases was a lymphosarcoma. After twelve roentgen-ray treatments, visible signs of the tumor could not be detected.

## Indian Medical Record, Calcutta

**47:** 129-160 (May) 1927

Forecasting and Control of Cholera Epidemics in India. L. Rogers.—p. 129.
Longevity or How to Attain Long Life. J. N. Ganguly.—p. 135.
Antibodies. A. Roy.—p. 138.

## Irish Journal of Medical Science, Dublin

**6:** 193-240 (May) 1927

*Progressive Venous Insufficiency: Pathogeny of Varicose Veins. G. Delater.—p. 199.
*Injection Treatment of Varicose Veins. H. Stokes.—p. 206.
*Appendix Reflex. A. B. Mitchell.—p. 208.
Intracapsular Fractures at Hip. T. E. Gordon.—p. 212.
Acute Osteomyelitis. W. Pearson.—p. 215.

**Venous Insufficiency.**—Delater is of the opinion that venous insufficiency not infrequently owes its origin to troubles of the endocrine system. Careful observation reveals the fact that the early discomforts caused by varicosities first manifest themselves during periods of endocrine disequilibrium.

**Injection Treatment of Varicose Veins.**—Stokes claims to have obtained good results in these cases from the intravenous injection of a 40 per cent aqueous solution of sodium salicylate. No case of embolism was noted.

**Appendix Reflex.**—Mitchell suggests that in certain subjects, with unstable nervous systems, a diseased appendix may be the exciting cause of symptoms of an entirely different character, such as migraine, cyclic vomiting, acidosis, epilepsy and petit mal.

## Kenya Med. Journal, Kenya, East Africa

**4:** 37-66 (May) 1927

Treatment of Pyorrhea Alveolaris. J. A. Ogden.—p. 38.
Polyvalent Vaccine in Prophylaxis of Bacillary Dysentery in East Africa. W. H. Kauntze.—p. 51.
Training of Native Hospital Orderlies. D. M. Kenny.—p. 62.
Aneurysm of Innominate Artery Causing Death from Asphyxia. K. T. K. Wallington.—p. 64.

## Lancet, London

**1:** 1275-1328 (June 18) 1927

Menstrual Function. B. Whitehouse.—p. 1275.
*Diagnosis of Acute Leukemia. J. B. Davey and L. E. H. Whitby.—p. 1279.
*Sulphur Metabolism in Arthritis Deformans. A. P. Cawadias.—p. 1283.
*Retinal Petechiasis: Curable Condition Causing Blindness. H. M. McCrea.—p. 1285.
Use of Allergen Proof Chamber in Treatment of Bronchial Asthma and Other Respiratory Diseases. W. Stoun van Leeuwen, W. Einthoven and W. Kremer.—p. 1287.
Four Cases of Tetanus Following Intramuscular Injection of Quinine. J. Macqueen.—p. 1289.
Case of Auricular Fibrillation. E. E. Laslett.—p. 1290.
*Epilation by Thallium Acetate. F. R. Curtis.—p. 1290.

**Diagnosis of Acute Leukemia.**—The differentiating diagnostic point of acute lymphatic leukemia from acute myeloblastic leukemia, other leukemias and glandular fever, according to Davey and Whitby, is splenic enlargement, which is not marked in the acute lymphatic leukemia of adults, but is observed in children. It is not usually marked in acute myeloblastic leukemia. Splenic enlargement is present in some cases of glandular fever. In the primary acute leukemias, the symptoms rarely exceed a few weeks. Hemorrhages are absent in glandular fever. In the acute lymphatic leukemia of adults, the number is often within normal limits, and probably rarely exceeds 30,000. In children, the figure may be considerably higher. In acute myeloblastic leukemia, the total figure may be considerably higher, but in the fulminating acute form it is usually low. In glandular fever the usual number is from 20,000 to 30,000. Large type lymphocytes are characteristic of acute lymphatic leukemia and of glandular fever. The presence of "smeared nuclei" is very characteristic of the lymphatic type. Cases in which there is a mixed count of large lymphocytes and megaloblasts usually terminate as pure myeloblastic. Reduction in numbers and hemoglobin is characteristic of both acute types, but is most marked in acute myeloblastic leukemia. Numerous megaloblasts and macrocytes suggest myeloblastic. In both types the anemia is rapidly progressive, and the prognosis as to duration depends on the red cell count and hemoglobin rather than on the leukocyte count. Changes in the numbers of red cells and abnormal red cells are absent in glandular fever.

**Sulphur Metabolism in Arthritis Deformans.**—Cawadias states that in arthritis deformans sulphur oxidation is not disturbed; sulphoconjugation is in some cases slightly increased, but there is a definite inefficiency of thiopexy. He has seen in some patients an improvement of the thiopexic function under the influence of sulphur treatment.

**Petechiasis Causes Hematemesis and Melena.**—McCrea asserts that hematemesis and melena may be caused simply by petechiasis in the mucous membrane of these parts as a result of septic foci elsewhere in the body. Petechiasis may end in actual ulceration in the stomach, duodenum and intestine. Consequently, it is of the utmost importance in any

of these conditions to seek and cure a septic focus before excising or operating on viscera in cases of hematemesis, melena or hematuria. Further, it is possible that metrorrhagia or menorrhagia may again be examples of petechiasis due to a septic focus elsewhere in the body.

**Epilation by Thallium Acetate.**—Using rats as experimental animals, Curtis found that epilation occurs constantly on the seventh or eighth day after the subcutaneous injection of a solution of thallium acetate equivalent to 7.5 mg. per kilogram of body weight. In all cases, the solution was freshly made immediately prior to injection. Solutions of thallium acetate, in similar doses, prepared and placed in sterilized ampules three months previously, were tested on a series of rats. Epilation occurred promptly on the eighth day after injection, thus showing that the date of the preparation is not of any moment. A point worthy of mention is the danger of giving a second dose too soon after the first dose.

## Medical Journal of Australia, Sydney

**1:** 703-736 (May 14) 1927

Difficult Child. J. Bostock.—p. 704.
Empyema in Adults: Analysis of Records. J. R. Williams.—p. 710.
Pellagra. S. J. Cantor.—p. 713.
Certain Therapeutic Measures in Dermatologic Practice. W. Upton.—p. 715.
Multiple Superficial Scarring Ulcerations of Small Intestine and Duodenal Scar, with Pyloric Obstruction. M. Scott and J. B. Cleland.—p. 718.
Gas Infection of Uterus with Jaundice Following Abortion. F. H. Beare and J. B. Cleland.—p. 719.
Complicated Dextrocardia. J. E. Sherwood.—p. 720.
Pseudomyxoma Peritonei of Appendiceal Origin and Mucocele of Appendix. J. B. Cleland and J. G. Sleeman.—p. 721.

**1:** 737-772 (May 21) 1927

Pathologic Lesions Present in 1,000 Consecutive Autopsies in Adelaide Hospital. J. B. Cleland.—p. 738.
*Carcinoma of Stomach, Gastric Ulcers and Duodenal Ulcers at Adelaide Hospital. J. B. Cleland.—p. 740.
*Typhus-Like Epidemics of Australia. W. S. McGillivray.—p. 743.
Influenza. J. P. Major.—p. 744.
Id.: Epidemiology and Prevention. F. R. Kerr.—p. 747.
Id.: Pathology and Clinical Features. R. P. McMeekin.—p. 750.
Peanut Impacted in Right Bronchus. J. M. Baxter and C. Macdonald.—p. 752.
Perthes's Disease. A. Pryde and W. P. Holman.—p. 753.
*Left Subclavian Aneurysm: Intrathoracic Ligature. R. J. Wright-Smith.—p. 754.
Acute Pulmonary Tuberculosis in Base of Right Lung. A. T. Nisbet.—p. 755.

**Incidence of Gastric Carcinoma and Ulcer and Duodenal Ulcer.**—In the 1,000 autopsies reported on by Cleland, there were thirty-six cases (3.6 per cent) of carcinoma of the stomach, eighteen cases of ulcer of the stomach, and eleven cases of duodenal ulcers.

**Typhus-Like Epidemic in Australia.**—Blood cultures made by McGillivray from cases of a typhus-like disease occurring in western Australia yielded growths with an appearance rather like that of Flexner's bacillus.

**Subclavian Aneurysm.**—In this case, Wright-Smith first tied the subclavian artery, and four weeks later the first part of the axillary artery. The alternate result could not be determined as the patient disappeared.

## Practitioner, London

**118:** 341-404 (June) 1927

Diagnosis of Early Pulmonary Tuberculosis. F. G. Chandler.—p. 341.
Diverticulosis and Diverticulitis of Large Intestine. F. De Quervain.—p. 352.
Clean Milk from Healthy Cows. W. G. A. Robertson.—p. 361.
Impending Death Under Anesthesia. H. Bailey.—p. 368.
Anesthetic Risks. C. T. W. Hirsch.—p. 375.
*Tuberculin Treatment of Asthma. T. Nelson.—p. 382.
Odors and Nature of Smell. G. Ward.—p. 390.

**Tuberculin Treatment of Asthma.**—Nelson endorses this treatment and relates his experience with it. He emphasizes the importance of giving the proper dosage and of continuing the treatment long enough. An ordinary course of treatment lasts a year and maybe a little longer. A guide to the initial dose is best obtained by a skin reaction to pure O. T. It is safe to start treatment with about 0.5 cc. of a 1:1,000,000 dilution.

## South African Medical Association Journal, Cape Town

**1:** 241-268 (May 28) 1927

Pulsus Alternans. J. F. Wicht.—p. 242.
Local Infection: Effect on General System. G. K. Cross.—p. 243.
Acute Pancreatitis. T. L. Sandes.—p. 245.
Rabies in South Africa. E. Cluver.—p. 247.
Dental Caries in Native Children Living in Kraals. A. T. Till.—p. 253.
Celiac Disease. E. P. Baumann.—p. 255.
Extensive Trauma with Protrusion of Bowel Followed by Complete Recovery. C. Sand.—p. 256.
Ambulatory Typhoid Diagnosed on Operating Table. F. A. van Coller.—p. 256.

## Archiv f. Japanische Chirurgie, Kyoto

**4:** 1-128 (May 20) 1927

Influence of Sympathectomy on Radiosensibility. S. Uno.—p. 1.
Septicemia as Cause of Death. K. Kuroda.—p. 28.
Treatment of Complicated Fracture with Secondary Suppuration. K. Sayo.—p. 34.
Forssman's Antigens: XII. M. Fujita.—p. 41.
Meinicke's Precipitation Reaction. M. Fujita.—p. 54.
Peculiarities of Complement Fixation Reaction Following Mixing of Meinicke's Antigen with Positive Wassermann Serum. M. Fujita.—p. 66.
Influence of Lipoids of Streptococcus on Phagocytosis of These Organisms in Circulating Blood. T. Hidaka.—p. 76.

## Japan Medical World, Tokyo

**7:** 65-95 (March 15) 1927

Reappearance of Previously Positive Dick Test and Blanching at Site of Previously Positive Test at Later Development of Scarlet Fever. G. Moriwaki.—p. 65.
Influence of Constituents of Thymus Cells Parenterally Introduced in Living Organism on Its Thymus and Other Organs. K. Wada.—p. 66.
*Effect of Turnip on Avian Polyneuritis. A. A. Horvath.—p. 71.

**Effect of Turnip on Avian Polyneuritis.**—The results of the experiments made by Horvath show that the turnip juice is apparently beneficial in light polyneuritis with opisthotonos, and has little or no effect in severe polyneuritis with paralysis. The turnip juice was found to be very effective in improving the severe enteritis in polyneuritis pigeons. The improvement after the administration of turnip juice to polyneuritic pigeons seems to occur in from six to twenty-four hours, the birds continuing on a diet of polished rice and water. In two pigeons out of the ten (i. e., in 20 per cent), kept permanently on polished rice and diluted turnip juice, polyneuritis still developed in thirty-seven and forty-eight days. Out of the twenty-five pigeons kept on polished rice and water, ten developed polyneuritis in from nineteen to forty-nine days, which represents 40 per cent. It was noticed that the addition of turnip juice to the drinking water (1:1) resulted in a reduction of the occurrence of polyneuritis from 40 to 20 per cent.

## Japanese J. Obstet. & Gynec., Kyoto

**10:** 1-59 (March) 1927

Physiologic Research of Fetus: II. Function of Stomach. K. Tani.—p. 2.
*Ferment in Cyst-Fluid of Ovary: I. Amylase. T. Tachibana.—p. 13.
*Physiologic Investigation of Fetus: I. Ferment of Digestive Organs: Trypsinogen in Pancreas. T. Tachibana.—p. 27.
Chemical Blood Reaction of Sex Determination. J. Sano.—p. 33.
Intraspinal Injection of Lobeline. F. Hazama.—p. 38.

**Ferment in Ovarian Cyst Fluid.**—Tachibana concludes that all ovarian cyst fluid contains amylase, the amount varying in different lesions.

**Trypsinogen in Pancreas.**—Tachibana asserts that the pancreas of the fetus and of the new-born child secretes trypsinogen, antecedent to trypsin, and that the fetus secretes it even in the fourth month. It is supposed, moreover, that the fetus gains the function of secreting trypsinogen at the same time that the pancreas comes into existence.

## Sei-I-Kwai Medical Journal, Tokio

**46:** 1-15 (May) 1927

*Stimulating Action of Ergotamine on Uterine Muscle. S. Matsuyama.—p. 1.
Morphologic Changes of Pavement Epithelium of Albino Rats Fed on Vitamin A Deficient Diet. Y. Fujimaki.—p. 15.

**Action of Ergotamine on Uterine Muscle.**—Matsuyama found ergotamine a vigorous exciter of contractions of the surviving uterus, gravid as well as nongravid, in dilutions as high as 1:200,000. The tubes are similarly affected.

## Archives des Maladies du Coeur, etc., Paris

**20:** 137-200 (March) 1927

Character and Origin of Fibrillation. S. de Boer.—p. 137.
Definition and Limits of Auricular Flutter. L. Bard.—p. 150.
Acid-Base Balance in Cardiac Insufficiency. J. Heitz and F. Nepveux.—p. 169.

**20:** 201-280 (April) 1927

*Effect of Epinephrine and Nitroglycerin on the Blood Stream. E. Geraudel and A. Luisada.—p. 205.
Leukemia Characterized by Colorless Mononuclears. G. Lion and J. Pernet.—p. 219.
*Pathogenesis of Sclerosis of the Pulmonary Artery. M. Lenoble et al.—p. 246.

**20:** 281-360 (May) 1927. Partial Index

Accumulated and Isolated Extrasystoles. S. de Boer.—p. 281.
Percussion of the Sternum in Dilatation of the Aortic Arch. C. Rozkowski.—p. 299.

**Action of Epinephrine Plus Nitroglycerin on the Arteries of the Cardiac Nodes.**—Five young persons, free from apparent lesions of the cardiovascular system were injected by Geraudel and Luisada with a mixture of epinephrine and nitroglycerin. The auricular and ventricular contractions and the contractions of the brachial and tibial arteries were recorded before and after the injection. The auricular and ventricular contractions depend on the amount of blood carried to the corresponding nodes by the local arteries. These contractions become accelerated when the blood in these arteries increases; they are retarded when it decreases. After injection of the mixture changes in the arteries of the cardiac nodes and in the arteries of the extremities were evident in the electrographs. The tracings revealed the presence of "premature" systoles or proiosystoles. Occurrence of the latter appears to be due to a sudden increase of blood in the nodal artery. The results testify to a muscular activity in the arteries of the cardiac nodes.

**Pathogenesis of Sclerosis of the Pulmonary Artery in Ayerza's Disease.**—Lenoble and his co-workers describe two cases observed in men, aged 52 and 41 respectively. Neither syphilis, malaria nor chronic alcoholism appeared in the history. In the authors' belief, hypertension and tuberculous infection are the two pathogenic factors. The shape of the chest, recurring bronchitis and long contact with a tuberculous person in these cases tended to confirm the theory. The albumin test was positive in both patients. Localization of the pathologic process exclusively in the pulmonary artery is explained by the structure of this vessel. Thinness of its walls creates a point of lessened resistance, which favors degeneration of the coats.

## Bulletins de la Société Médicale des Hôpitaux, Paris

**57:** 779-846 (June 9) 1927. Partial Index

*Cerebral Tumor Simulating General Paralysis. P. Lechelle et al.—p. 785.
Meningeal Hematoma of Encephalitic Origin. Darleguy.—p. 805.
Insulin in Uncontrollable Vomiting of Pregnancy. F. Rathery and J. Marie.—p. 842.
*Case of Kussmaul's Dyspnea Without Acidosis. Widal et al.—p. 844.

**Case of Cerebral Tumor Simulating General Paralysis.**—In Lechelle, Baruk and Ledoux-Lebard's case, a man, aged 52, developed mental disturbances surprisingly similar to those of the early stages of general paralysis. Lumbar puncture and eye examination revealed the presence of intracranial hypertension. This suggested the diagnosis of tumor, probably in the frontal lobe and corpus callosum. Deep roentgenotherapy was applied to the left and to the right frontal and parietal regions. A total of 1,000 Behnken units was used at one sitting; the total dose applied to each field ranged from 4,000 to 5,000 units. Two series, totaling twenty-two exposures, were given with an interval of three weeks. The exposures took place three times a week. The treatment resulted in a rapid improvement of the mental condition. The intracranial hypertension did not increase; there was even considerable decrease in the choked disk. The treatment was not preceded by decompressive trephining. The roentgen rays appear to be especially beneficial in glioma; they are contraindicated in malignant brain tumors. It is presumed that the improvement is a transient one.

**Case of Kussmaul's Dyspnea Without Acidosis.**—Widal, Boulin, Thomas and Wolf describe a case of anthrax of the lids of the right eye with malignant edema in a man, aged 30. Dyspnea of the Kussmaul type was observed in the course of the disease. The alkali reserve remained unchanged. Evidently noninfectious acidosis was responsible for the abnormal respiration. Their theory is that bacterial toxins or products of defective metabolism due to infection may exert an irritating action on the bulbar respiratory center.

## Comptes Rendus de la Société de Biologie, Paris

**96:** 741-820 (March 25) 1927. Partial Index

Rôle of Light in Phenomena of Shock. J. Risler and A. Philibert.—p. 747.
*Immunization with Antitoxin by the Nose. G. Ramon and C. Zoeller.—p. 757.
Phenomenon of "Transmissible Agglutination." C. Zoeller and F. Meersseman.—p. 760.
*Body Temperature and Atmospheric Pressure. P. Béhague et al.—p. 766.
Significance of Bidder's Organ in Toads. K. Ponse.—p. 777.
*Action of Digitalis and of Strophanthin on Parasympathetic Nerves of the Intestine. P. Weger.—p. 803.
*Action of Strophanthin on the Blood Picture. P. Weger.—p. 806.
Significance of the Suprarenals in Action of Nicotine on the Blood Pressure. H. Rydin.—p. 810.

**Antitoxic Immunization by the Nasal Route in Man.**—Ramon and Zoeller experimented with concentrated diphtheria anatoxin (obtained by evaporation) mixed with glycerin. It was introduced into the nose of several adults whose serum contained diphtheria antitoxin. The instillation was repeated twice a day for six days. The antitoxic value of the serums had increased markedly eight days after the last instillation. A positive Schick reaction became negative. The experiments were repeated with concentrated tetanus anatoxin. Human serums which neutralized from 40 to 100 lethal doses of tetanus toxin before the instillations neutralized from 200 to 500 lethal doses after the treatment. Absorption of the anatoxin by the rhinopharyngeal mucosa produced a general immunity similar to that from subcutaneous injections. The diphtheria bacillus is frequent in the nasopharyngeal tract. It secretes a toxin which is absorbed by the mucosa; prolonged absorption of the toxin induces an occult specific immunity. The mechanism of occult immunity in other infectious diseases is probably the same as in diphtheria.

**Variation in Body Temperature Occurring with Low Atmospheric Pressure.**—Rabbits were placed in a box from which air was withdrawn. Reduction in the air pressure was paralleled by fall of temperature in the animals. Hypothermia occurring in low atmospheric pressure, such as at a high altitude, resembles that in prolonged asphyxia. It is due to reduced oxidation resulting from oxygen deficiency.

**Action of Digitalis and of Strophanthin on the Parasympathetic Nerves of the Intestine.**—Weger's study was made on the isolated small intestine of rabbits. Digitalis or strophanthin was added to the solution (Tyrode's) in which the intestine was placed. Under the influence of these substances the amplitude and frequency of the intestinal contractions increased. The theory is that digitalis and strophanthin enhance the irritability of the parasympathetic fibers, rather than that of the muscle cells. Intravenous injections of strophanthin were found to provoke a marked leukocythemia in the animals. There was considerable increase in the number of thrombocytes, persisting for several weeks. Evidently strophanthin irritates the part of the bone marrow that produces thrombocytes.

## Paris Médical

**63:** 513-548 (June 4) 1927

Infectious Diseases in 1927. C. Dopter.—p. 513.
Study of Malaria: Its Treatment. E. Marchoux.—p. 526.
Gonococcus Reaction in Gonorrhea. H. Jausion et al.—p. 531.
Malta Fever and Micrococcus Melitensis. E. Burnet.—p. 536.
Diphtheria Epidemic in Paris During 1926-1927. P. Lereboullet and M. David.—p. 543.
Serodiagnosis in Malta Fever. M. Béguet.—p. 546.

**63:** 549-564 (June 11) 1927

Therapeutic Value of "Sanocrysin." F. Dumarest et al.—p. 549.
Diathermy in Treatment of Acute Coryza. H. Bordier.—p. 562.

**63:** 565-608 (June 18) 1927

Gynecology in 1927. S. Huard.—p. 565.
Torsion of the Pedicle in Ovarian Cysts. E. Forgue.—p. 576.
*Severing the Presacral Nerve in Gynecology. G. Cotte.—p. 583.

*Phlebitis as Sequela of Gynecologic Operations. A. Schwartz and L. Schil.—p. 587.
Obstetrics in 1927. J. Ravina.—p. 593.
Retrodeviation of the Uterus After Delivery. A. Fruhinsholz.—p. 596.
*Eclampsia of Anaphylactic Origin. Lévy-Solal.—p. 600.

**Severing the Presacral Nerve in Gynecology.**—Cotte severed the presacral nerve in about one hundred cases. There were not any by-effects. The operation did not affect micturition, defecation or sexual functioning. Two of the women on whom the operation was done became pregnant; delivery was normal. The operation was performed in thirty cases of dysmenorrhea. The menstrual pain disappeared; the cure has lasted as long as two and a half years. The method was effectual in a case of pelvic neuralgia from hyperirritability of the hypogastric plexus. Cases of functional amenorrhea or of trophic disturbances of the genital organs (vulval kraurosis), caused by changes in the sympathetic system may benefit from the operation.

**Phlebitis as Sequela of Gynecologic Operations.**—Of thirty cases of uterine fibroma, Schwartz and Schil found inflammation of the intima of the uterine veins in 66 per cent. The lesion was present in 16 per cent of twenty-three cases of other gynecologic diseases. Phlebitis occurred after operation in three cases of fibroma and in one case of uterine sclerosis. Endophlebitis is regarded as the predisposing cause and the presence of bacilli as the predominant factor in phlebitis. During an epidemic, the bacillus of influenza may be responsible for occurrences of phlebitis, as may be bacilli of the genital tract; or, still more frequently, the colon bacillus of the intestine. A vaccine prepared with 80 per cent of colon bacilli, 15 per cent of enterococci and 5 per cent of diplococci and streptococci was used in prevention of postoperative phlebitis. The authors do not draw any conclusions, for the reason that the treatment was used recently and in only a few cases.

**The Anaphylactic Type of Eclampsia.**—Lévy-Solal distinguishes nephritic, hepatic and anaphylactic eclampsia. Involvement of the liver is as frequent as that of the kidneys. Anaphylactic eclampsia occurs in women free from renal or hepatic lesions. In these patients, the blood serum contains an antigen which induces the convulsions. This is proved by the suddenness of the attacks and by their disappearance after the fetal death, when the passage of the antigen into the maternal vessels is suppressed. Intracardiac injection of serum from patients with eclampsia induces in animals a colloidoclastic shock. Preliminary injection of a minimal dose of the serum produces desensitization. In five cases of eclampsia, good results were obtained from pilocarpine hydrochloride combined with withdrawal of a small amount of blood.

## Presse Médicale, Paris

**35:** 737-752 (June 11) 1927

Urticaria and Shock from Muscular Effort. Pasteur Vallery-Radot et al.—p. 737.
Action of Mineral Waters on Colloids and Diuresis. P. L. Violle and P. Dufourt.—p. 740.
Serum Treatment of Scarlet Fever. J. Mouzon.—p. 741.

**35:** 753-768 (June 15) 1927

*Acrodynia in Children and Adults. R. Debré and C. Petot.—p. 753.
Serums, Vaccines and Antiseptics in Prevention of Puerperal Infection. J. L. Wodon.—p. 756.
*Hypothenar Reflex or Babinski Sign in the Hand. E. Juster.—p. 759.

**Comparative Study of Infantile Acrodynia, Epidemic Acrodynia in Adults, Pellagra and Chronic Ergot and Arsenic Poisoning.**—Debré and Petot describe a case of acrodynia, developing in a boy, aged 4. They compare the syndrome of sporadic acrodynia, occurring chiefly in young children, with that of epidemic acrodynia observed in adults. The syndromes resemble each other, but they are not identical. A parallel study of acrodynia and of pellagra, also of chronic ergot and arsenic poisoning reveals the presence of common clinical features. The authors' theory is that the disease is of alimentary rather than infectious origin.

**Skin Reflex in the Hypothenar Region or Babinski Sign in the Hand.**—The hypothenar reflex is elicited in the following way: While the patient's forearm, arm and first phalanx are extended, the other phalanges are kept bent. In case of lesions in the upper portion of the pyramidal tract, scratching, friction, or pinching of the skin of the hypothenar region causes adduction of the thumb. The sign is manifest in the beginning of epileptic seizures. In cases of complete hemiplegia, the hypothenar sign coincides with Babinski's sign. In slight hemiplegia, especially in brachial monoplegia, the hypothenar sign alone reveals the location of the lesion in the pyramidal tract. In tumors of the brain or of the upper part of the spinal cord, in pseudobulbar paralysis, multiple sclerosis, epidemic encephalitis, amyotrophic lateral sclerosis, acute anterior poliomyelitis and syringomyelia the hypothenar sign testifies to changes in the pyramidal tract, while it is not possible to elicit Babinski's sign. The hypothenar sign, Juster points out, is a normal phenomenon in children under the age of 3.

**35:** 769-784 (June 18) 1927

Mechanism of Tardy Contractions in Hemiplegia. L. Bard.—p. 769.
*Carbohydrate Metabolism in Renal Diabetes. P. Govaerts et al.—p. 771.
Study of Ayerza's Disease. M. Nathan.—p. 773.

**Carbohydrate Metabolism in a Case of Renal Diabetes.**—Govaerts, Lemort and Eeckhoud's investigation was conducted on a woman, aged 42. Considerable glycosuria (from 40 to 60 Gm. of sugar per liter of urine) was associated with elimination of a large amount of acetone bodies. There was a constant hypoglycemia. Hyperglycemia after ingestion of glucose increased the sugar in the urine. Fasting enhanced the acetonuria; the latter disappeared under a diet rich in starch. Ingestion of 100 Gm. of glucose had little influence on the respiratory quotient. Insulin or pituitary extract did not affect the urinary sugar. Administration of epinephrine was followed by hyperglycemia. The excessive permeability of the kidneys for glucose, and the consequent hypoglycemia were the essential disturbances in this case.

## Schweizerische medizinische Wochenschrift, Basel

**57:** 561-584 (June 11) 1927

*Drowning in Subjects with Perforation of the Eardrum. E. Schlittler.—p. 561.
Source of Error in Oculo-Cardiac Reflex. C. Minerbi.—p. 564.
*Buscaino's Urine Test in Mental Diseases. L. Cabernard.—p. 570.
Basal Metabolism in Gynecology. E. Jaeggy.—p. 575.
Radium Treatment. E. Wassmer.—p. 578.
Treatment of Aphthous Stomatitis. C. Schneiter.—p. 579.

**Drowning in Subjects with Perforation of the Eardrum.**—Schlittler deals especially with the medicolegal aspects of drowning in subjects with a perforated eardrum. Such an occurrence was suspected as early as 1885 by Lucae and described more clearly in 1899 by Danziger. The recent observations on caloric nystagmus explain the accident. Perforation of the eardrum may occur in diving and the cold water does the rest.

**Buscaino's Urine Test in Mental Diseases.**—In healthy individuals Cabernard always found a negative (white) reaction. In doubtful cases the reaction was at the utmost brown. The brown and black reaction occurred chiefly in diseases of the brain and in organic psychoses. In manic-depressive insanity, the reaction is rarely black. The black reaction was never found in neurasthenia or general paralysis. Buscaino attributes the reaction to amines and uses the following technic: He mixes 3 cc. of urine with 1.5 cc. of a 5 per cent solution of silver nitrate and boils for thirty minutes. The color of the precipitate indicates the reaction, which is more pronounced when using equal parts of the urine and of the reagent.

## Pediatria, Naples

**35:** 633-688 (June 15) 1927

Vaccine Treatment of Bronchopneumonia. U. Avellone.—p. 633.
*Tubercle Bacilli in the Pharynx in Infancy. M. Miraglia.—p. 649.
Deforming Arthritis in Children. M. Gerbasi.—p. 652.
Tuberculosis of Bones and Joints. F. Del Vicario.—p. 666.
Koplik's Spots. N. Iavarone.—p. 669.
Hematuria in Children. L. Auricchio.—p. 673.

**Tubercle Bacilli in the Pharynx in Infancy.**—Samples of pharyngeal mucus were taken by Miraglia from twenty infants who gave a positive tuberculin reaction. None of the guinea-pigs inoculated with the mucus developed tuberculosis.

## Policlinico, Rome

**34:** 847-882 (June 13) 1927

Torsion of the Omentum. L. Urbani.—p. 847.
Treatment of Acute Peritonitis. G. Gaeta.—p. 849.
*Peritonitis from Postoperative Gangrene of the Appendix. M. Fasano. —p. 851.
*Erroneous Diagnosis of Abscess. G. Vernazza.—p. 852.
"Enzyme Reaction in Pulmonary Tuberculosis." L. Sivori.—p. 853.

**Peritonitis from Postoperative Gangrene of the Appendix.**—In a woman with chronic salpingitis, Fasano experienced difficulty in removing the tube. On the fifth evening after the intervention, the patient complained of severe pains in the abdomen, she died the next morning. The cause of death was diffuse peritonitis originating from a gangrenous appendix. He believes that the appendix had probably been injured during the operation.

**Wrong Diagnosis of Abscess.**—Vernazza's patient presented a swelling on the internal surface of the right thigh, about two fingerbreadths below the genitofemoral crease. Since there was fluctuation, a diagnosis of cold abscess was made, and the author withdrew, to his surprise, 400 cc. of a slightly turbid fluid. Then he examined the woman and found free fluid of the same appearance in the peritoneal cavity. The patient had tuberculosis of the peritoneum and the exudate had penetrated along the obturator vessels.

**34:** 253-300 (June 15) 1927. Surgical Section

Local Lymphadenoid Changes in Appendicitis. R. Calvanico.—p. 253.
*Partial Reversal of Small Intestine in Dogs. G. Forni.—p. 275.
Appendicitis in a Hernia in Infancy. M. Melletti.—p. 280.
Pathology of the Duodenum. G. Montegrosso.—p. 293.

**Partial Reversal of the Small Intestine in Dogs.**—Forni cut out the larger part of the small intestine in dogs, and reversed it end for end, restoring the continuity of the tube with two anastomoses. The intestinal contents of these animals moved slowly but steadily toward the colon. The dogs died within a few weeks from necrotic desquamative enteritis.

## Riforma Medica, Naples

**43:** 505-528 (May 30) 1927

University of Naples. M. Landolfi.—p. 505.
*Hemoclasis in Syphilis. L. D'Amato.—p. 508.
Sensitizing Substance of Pollen. G. Melli.—p. 511.
Heredity in Cancer. C. Guarini.—p. 517.
Interstitial Inguinal Hernia in Woman. M. Penada.—p. 524.

**Hemoclasis in Syphilis.**—D'Amato injected subcutaneously or intravenously compounds of mercury or bismuth. He believes that leukopenia resulted in the large majority of syphilitic individuals and leukocytosis in nonsyphilitic subjects. He regarded a decrease of from 600 to 800 leukocytes per cubic millimeter as weakly or doubtfully positive, a decrease of 1,000 as a positive reaction.

**43:** 529-552 (June 6) 1927

Multilocular Lymph Cyst of the Neck in Adult. L. de Gaetano.—p. 529.
The Para-Pfeiffer Bacillus in Endocarditis Lenta. C. Ninni.—p. 532.
Megacolon and Mega-Ureter. R. Broglio.—p. 535.
*Intravenous Injections of Dextrose in Dermatology. C. Maderna.—p. 538.

**Intravenous Injections of Dextrose in Dermatology.**—Maderna reports favorable results in various dermatoses from daily intravenous injections of 10 cc. of a 33 per cent solution of dextrose. Eczema, herpes zoster, and especially an exfoliative dermatitis (from bismuth) in a patient with psoriasis yielded rapidly to the treatment.

**43:** 553-576 (June 13) 1927

Tuberculosis and Emigration. A. Ferrannini.—p. 553.
*Plastic Spleen in Banti's Disease. G. Castronuovo.—p. 554.
Intestinal Bilharziasis in Cyrenaica. C. Rizzo.—p. 555.
Anastomoses Between the Pulmonary and General Circulations. C. Trunecek.—p. 561.
Long Latency in Surgical Nephropathies. M. Sorrentino.—p. 571.

**Plastic Spleen in Banti's Disease.**—A case of fibroadenia of the enlarged spleen, anemia, leukopenia and repeated intestinal hemorrhages is reported by Castronuovo. The patient, a man, aged 21, had neither jaundice nor cirrhosis of the liver. The Wassermann reaction was strongly positive, in spite of repeated treatments, and was probably of nonspecific origin. The most peculiar clinical feature was the plasticity of the spleen. A finger could be dug into it almost as easily as into clay, without provoking pain. The patient recovered after splenectomy.

## Anales de la Facultad de Medicina, Montevideo

**11:** 709-815 (Nov.-Dec.) 1926

*Cardiac Rheumatism in Children. L. Morquio.—p. 709.
*Pharmacology of Insulin. J. A. Collazo.—p. 773.
*Volvulus of the Stomach. P. Mañé.—p. 791.
Electric Conductivity as Test of Purity of Water. M. M. Rodriguez Rego.—p. 794.

**Cardiac Rheumatism in Childhood.**—The involvement of the heart, states Morquio, is the chief manifestation of rheumatism. Joint manifestations are only temporary and fill but a secondary place. This type of heart disease is represented by chronic myocarditis with sclerotic patches, reaction of degeneration and Aschoff's nodes. Among Morquio's 1,000 cases of heart disease in children, the origin was nonrheumatic in less than ten. None had any connection with scarlet fever. Scarlatinal rheumatism varies from acute rheumatic fever in the uselessness of salicylates and the absence of cardiac complications. Scarlet fever and rheumatism may perhaps merely coincide and combine forces. In chorea, the rheumatic and encephalitic cases must be differentiated, as there is heart involvement in the former and not in the latter. Among the 1,000 cases, only one, with mitral incompetence, was secondary to gonococcal rheumatism and one to typhoid fever. Rheumatism was not present in the latter case. Mitral stenosis is uncommon in children. The rheumatic condition may disappear spontaneously or under the influence of salicylates; it may also persist, reattacking the heart regularly until a definite murmur remains. In general, children tolerate heart disease remarkably well. The real seriousness attaches to pericarditis, which always becomes true pancarditis. Death may, however, supervene without pericardiac involvement. The structure secondarily most affected by heart disease is the liver. Sodium salicylate is not only the best remedy for acute inflammatory rheumatism but is essential for preventing cardiac complications.

**Pharmacology of Insulin.**—Collazo reports the results of his studies and surveys the literature. Insulin has the chemical characteristics of primary albumoses, and especially of protoproteoses and heteroproteoses. It resembles them in being a grouping of amino-acids. Attempts at synthesis should start with these acids. Any fractional precipitation will always be handicapped by its inability to go beyond complex groupings. It is very important to compare the formula of amino-acids during hydrolysis and digestion of insulin with the molecular structure of chemically defined hormones, such as epinephrine, thyroxin and histamine. Insulin possibly includes several hormones.

**Gastric Volvulus.**—The case described by Mañé is interesting through the absence of the usual causative lesions: pyloric or midgastric stenosis, adhesions or hernia. Increased peristalsis or gas may have been a factor. Eleven years before, a bullet had perforated the parietal peritoneum. The picture of gastric volvulus developed suddenly, with continuous vomiting. The patient recovered following a gastro-enterostomy with partial removal of the greater omentum.

## Archivos Arg. de Enf. del Ap. Digest., Buenos Aires

**2:** 465-624, 1927

*Treatment of Trichomonas Infection. E. Escomel.—p. 465.
*Gastric Tetany and Ulcer. C. Bonorino Udaondo and L. V. Sanguinetti. —p. 471.
*Basal Metabolism in Obesity. M. R. Castex and M. Schteingart.—p. 485.
Histamine in Gastric Diseases. L. V. Sanguinetti.—p. 504.
Abdominal Unbalance. P. Sangiorgi.—p. 534.
Syphilis of the Pancreas. J. L. Carrera.—p. 546.
Roentgen-Ray Diagnosis of Gastric Ulcer. A. Piga.—p. 564.

**Treatment of Intestinal Trichomonas Infestation.**—*Trichomonas intestinalis*, as a parasite, is usually benign, but, Escomel warns, it may become virulent and even deadly. The most efficient, as well as the safest, cheapest and most easily applied treatment is turpentine oil, used by him since 1910. It is specific not only against trichomonas, but also against lamblias and tetramitus.

**Gastric Tetany Associated with Duodenal Ulcer.**—Bonorino and Sanguinetti's patient had suffered from duodenal ulcer intermittently for eleven years. For the last two years tetanic attacks had developed with each digestive crisis. The increased nervous excitability subsided after cholecystectomy and gastro-enterostomy.

**Basal Metabolism in Obesity.**—The basal metabolic rate was studied by Castex and Schteingart in one hundred overweight patients. The figures were normal in 55 per cent, above normal in 23 per cent and below normal in 22 per cent. The series included eighteen men and eighty-two women. The age varied from less than 20 years (12 per cent) to more than 50 years (11 per cent). Among the hundred cases, endocrine disturbances were found as follows: hyperthyroidism or hypothyroidism, fifteen; genital, twelve; pituitary and genital, thirteen; thyroid and pituitary, three. In 80 per cent, the obesity seemed exogenous, i. e., caused by overeating and sedentary habits. The thyroid exerted some causative influence in 9 per cent, and the other glands seemed even less at fault. If basal metabolism is normal, treatment must rely exclusively on diet and exercise. Organotherapy should be reserved for cases with a subnormal rate.

## Archivos Esp. de Enf. del Aparato Digestivo, Madrid

**10:** 257-320 (May) 1927

Retractile Choledochitis. R. Luis y Yagüe and A. Catalina.—p. 257.
*Pseudotyphoid from Ascaris. J. Sandoval Amorós.—p. 267.
Large Jejuno-Cutaneous Fistula. R. Finochieto.—p. 272.

**Ascaris Infestation Resembling Typhoid Fever.**—In Sandoval's case in a little girl, every symptom, including rose colored spots on the abdomen, suggested typhoid fever. However, after ten days, an ascaris was expelled in the vomitus. Santonin and calomel were then given, and, after the discharge of twenty-five worms, the condition quickly subsided. Examination of the feces will often clear up obscure diagnostic problems, to the patient's benefit.

## Archivos Lat.-Amer. de Pediatría, Buenos Aires

**21:** 167-253 (March) 1927. Partial Index

Anaphylaxis to Cow's Milk. L. Morquio.—p. 165.
Treatment of Vomiting in Infants. J. Damianovich.—p. 172.
Case of Infantile Scurvy. M. Acuña and M. T. Vallino.—p. 196.
Septicemia in an Infant. F. Schweizer.—p. 200.
Giant Nevus in an Infant. M. T. Vallino.—p. 225.
*Severe Anemia in an Infant. A. A. Ugón and A. Volpe.—p. 233.
*Diphtheria and Pseudocroup. J. J. Leúnda.—p. 238.
Uremia with Convulsions. M. Rodella.—p. 241.
*Tuberculous Epididymitis in an Infant. L. M. Petrillo.—p. 244.
Thrombophlebitis with Measles. A. Carrau and J. C. Etcheverry.—p. 247.

**Severe Anemia Without Apparent Cause in an Infant.**—Ugón and Volpe's patient was a breast fed girl, aged 2 months. Severe anemia developed without apparent cause. There was no paternal history of syphilis and the Wassermann test proved negative. Death seemed inevitable, but under injections of the mother's blood and sulpharsphenamine, the child recovered. A hemorrhage to explain the anemia could not be found.

**False Croup Ending in Diphtheria.**—A girl, 3 years old, had suffered for a year from attacks of laryngismus stridulus. When seen by Leúnda, on admission to the hospital, asphyxia impended. Though diphtheria bacilli were not found in the discharge, the clinical picture suggested immediate treatment with antitoxin. Both tubage and tracheotomy failed, and the patient died in a few hours. Postmortem cultures showed the diphtheria bacillus. As this organism readily attacks predisposed mucous membranes, the radical treatment of tonsils and adenoids should be considered from the first in all cases with a similar beginning.

**Tuberculous Epididymitis in an Infant.**—In a boy, aged 13½ months, Petrillo diagnosed tuberculosis of the epididymis secondary to pulmonary disease. The Wassermann test and the paternal history proved negative for syphilis. The tuberculin skin reaction was strongly positive. The child improved somewhat following ultraviolet-ray therapy, but died with symptoms of miliary tuberculosis after contracting whooping cough.

## Archivos de Medicina, Cirugía y Espec., Madrid

**26:** 661-688 (May 28) 1927

Treatment of Echinococcus Cysts of the Abdomen. A. Ferre.—p. 661.
Study of 1,170 Tonsillectomies. F. Aciego de Mendoza.—p. 664.
*Aldrich-McClure Test in Pediatrics. J. de Cárdenas y Pastor.—p. 668.

**The Intradermal Sodium Chloride Test in Pediatrics.**—In fifty-five infants and older children with various diseases, including kidney and heart lesions, and, especially, nutritive and digestive disturbances, Cárdenas tried Aldrich-McClure's test. In summer diarrhea the disappearance time of the wheals raised by the sodium chloride solution was shorter when the condition seemed more serious, and longer when signs of improvement appeared. The test proved very useful in determining the changes in the water equilibrium, especially in toxic infants.

## Boletín del Hosp. Civil de San Juan de Dios, Quito

**1:** 1-128 (Nov.) 1926 to (Jan.) 1927

Unusual Clinical Cases. J. M. Troya.—p. 6.
*Contagion and Transmission in Leprosy. G. Arcos.—p. 19.
Pulmonary Amebiasis. P. E. Albornoz S.—p. 28.
Intestinal Perforation by Ascaris. L. G. Dávila.—p. 53.
Development of the Embryo. G. Torres O.—p. 60.
Tonsillectomy. A. de la Torre.—p. 67.
Fractures and Rubbers. S. Lasso M.—p. 73.
A Twenty-Four Hour Hospital Service. M. H. Villacís.—p. 77.
Case of Wound of the Heart. E. Salgado V.—p. 83.
*Ouabain in Typhoid Fever. A. Mosquera.—p. 105.

**Contagion and Transmission in Leprosy.**—Arcos reviews in a philosophic spirit his long experience with leprosy. At the Pífo leprosarium, among 150 patients, he has not seen a single case of conjugal contagion. In about 66 per cent, inheritance may have a relative importance, as there are leprous parents, brothers, sisters, or cousins in the family. On the other hand, lepers may have healthy children. Some patients claim they have never been in contact with lepers. A couple, both leprous before marriage, have six children affected with the disease. Dr. Echeverría, of the same institution, quotes several cases of lack of contagiousness, among them that of a widow of two lepers, in succession, who lived among the sixty-five patients in the asylum and remained well. The rôle of insects seems very doubtful. Several patients who contracted itch from lepers months ago have not had any symptom or sign of leprosy. While house flies are prevalent in the leprosarium and carry acid-fast bacilli and contaminate food, there has not been a single case of fly-transmitted disease either among the employees or in the neighboring village. The inoculations made, for instance, in Colombia, are without value, as the fifteen children lived at leprosariums and were the offspring of lepers. Arcos has inoculated guinea-pigs and rabbits with leprous products, blood or macerated tubercles. The result was negative, although the tissues inserted in the peritoneum persisted and contained bacilli until their final elimination. He repeated Reenstierna's experiments on a macacus; after forty days a node developed, which contained bacilli. Morphologically these were identical with those of the inoculated leproma, but the node regressed slowly and at the end of a year not a sign remains. The disease attacks the genital organs and may cause impotence and sterility. If women become infected before puberty, they never menstruate. There must be some unknown carrier of the disease or Hansen's bacillus may be a mere saprophyte or a modality of the pathogenic germ.

**Ouabain in Typhoid Fever.**—In twelve cases of myocarditis occurring among 128 cases of typhoid fever, Mosquera used ouabain successfully.

## Brasil-Medico, Rio de Janeiro

**41:** 459-488 (May 14) 1927

"Sanocrysin" in Tuberculosis. H. Achilles.—p. 459.
Cancer from the Trophodynamic Viewpoint. A. L. Pimenta Bueno.—p. 466. C'td.
*Whooping Cough and Asthma. N. Ciancio.—p. 474.

**Asthma Cured by Whooping Cough.**—Ciancio quotes four cases in which, on contracting whooping cough, children recovered from asthma of long standing. He states the fact without attempting to draw conclusions.

41: 489-512 (May 21) 1927

Hysterical Hemichorea. H. Roxo.—p. 489.
*Chenopodium Oil. A. Machado.—p. 498.

**Components of Chenopodium Oil.**—Ascaridol is the constituent with marked vermifuge properties. After several years research, Machado has produced a dextrogyrate, racemic, terpenic peroxide having the characters of the natural ascaridol. The unpleasant taste is masked.

## Clínica, Buenos Aires

2: 1-44 (April-May) 1927

*Garlic Poisoning. J. A. Petrocchi and S. Gutman.—p. 5.
Endocrine Types. P. Heredia.—p. 9.
*Safety of Intratracheal Injections. O. P. Curti.—p. 15.
*Bromides in Pruritis. M. E. Massa.—p. 17.
Spontaneous Arteriovenous Aneurism. A. Tiscornia and A. Crocco.—p. 19.

**Poisoning by Garlic.**—In Argentina, country people are prone to resort to garlic as an anthelmintic as well as for other medical purposes. Petrocchi and Gutman report two cases of untoward results. A child, aged 5½ years, with whooping cough, was treated by the parents with garlic. Symptoms developed in a few hours, and, when the patient was seen after twenty-four hours, increased blood pressure, tachycardia, mydriasis, miosis and other alarming signs pointed to a desperate condition. The child died thirty-six hours after the onset of symptoms. Another child also exhibited signs of poisoning after taking garlic, but recovered.

**Innocuousness of Intratracheal Injections.**—Of some 10,000 tuberculous patients seen by Curti, about 650 received intratracheal injections for either diagnostic or therapeutic purposes. Fatal accidents did not occur. The only mishap was collapse in a patient with emphysema, while iodized oil was being injected. In children, old people, patients with heart trouble or asthma and inflammatory and acute respiratory conditions, the intratracheal route is contraindicated.

**Bromides in the Treatment of Pruritus from Eczema.**—A 10 per cent solution of strontium bromide added to a 20 or 30 per cent solution of glucose has proved, in Massa's hands, superior to sodium bromide and potassium bromide, which were suggested by Lebedjer for the treatment of eczematous itching. The dose is 10 cc., given intravenously. The number of injections required varied from four to fourteen. The local pain in the injected site subsided quickly. The same treatment proved successful in other dermatoses.

## Clínica y Laboratorio, Zaragoza

9: 341-428 (May) 1927

*The Blood in Infantile Diarrheas. A. Lorente Sanz.—p. 341.
Renal Tuberculosis. M. Serés e Ibarz.—p. 353.
Treatment of Gonorrhea. F. Sicilia Transpaderne.—p. 388.
Hemorrhages and Pregnancy. M. Vicente Carceller.—p. 393.

**The Blood in Infantile Diarrheas.**—In twelve infants, aged from 3 to 15 months, Lorente studied the blood count. A marked polynucleosis was the rule. When the large intestine was involved, mononucleosis prevailed. In the infant, transitional mononuclears appear which may be assigned to the lymphocyte group, but are hard to identify as large mononuclears. In cases of whooping cough associated with intestinal disturbances, more typical lymphoid cells develop. In gastro-intestinal disturbances in infants, the usual eosinophilia disappears. Cases of hypothrepsia may be an exception. Arneth's formula shifts markedly to the left, but in athrepsia the deflection rate falls sharply.

## Progresos de la Clínica, Madrid

35: 321-400 (May) 1927

Photography in Eye Diseases. A. Castresana.—p. 321.
*Anatomic Anomalies of the Phrenic Nerve. A. Perera.—p. 335.
New Technic for Injecting the Gasserian Ganglion. V. Sanchis Perpiñá and R. Diaz Sarasola.—p. 345.
Visceral Leishmaniasis. G. Pittaluga.—p. 350.
Micrococcus Tetragenus. J. V. Lambea.—p. 352.
Occult Spina Bifida. J. Gonzáles-Aguilar.—p. 354.
Gastric Chromoscopia. H. G. Mogena and A. López Fernández.—p. 357.
Jejunal Ulcers. A. Casanova Seco.—p. 363.

**Anatomic Abnormalities of the Phrenic Nerve.**—Perera's illustrations, many of them in colors, show the anomalies which may handicap the surgeon in trying to remove the phrenic nerve. Contrary to the general belief, phrenicectomy does not cause appreciable symptoms with the exception of slight dyspnea, perhaps because the nervous bundles of the vagus are not touched.

## Revista de Médicina y Cirugía de la Habana, Havana

32: 297-328 (May 10) 1927

*Tumors of the Neck. E. Stincer.—p. 297.
Case of Horseshoe Kidney. E. Torroella.—p. 310.
Glomerular Carcinoma of Sweat Glands. C. M. Ramirez Corria.—p. 316.

**Congenital Fistulas and Tumors of the Neck.**—Stincer's ten cases of progressive bronchial lesions include a bronchial cyst, four primary bronchial fistulas, two thyroglossal fistulas, one cystic lymphangioma and one congenital pretragal fistula. Any cervical swelling or sinus must suggest the possibility of congenital malformation. Treatment is essentially surgical, and roentgenographic examination should not be omitted.

## Revista Médica Latino-Americana, Buenos Aires

12: 961-1108 (April) 1927

Tumorous Linitis Plastica. F. R. Ruiz and J. M. Borzone.—p. 961.
*Treatment of Varicocele. A. Cassinelli.—p. 985.
Tuberculosis of the Eye. J. Lijó Pavía.—p. 991. C'td.
Gas Distension in Pneumothorax. A. Sarno.—p. 1001.
*Diuretics. D. J. Rojo.—p. 1015.
Timing of Reactions. J. V. d'Oliveira Esteves.—p. 1040.
Dermotropic and Neurotropic Spirochetes. R. C. Bizzozero.—p. 1056.

**Ivanissevich's Operation for Varicocele.** — Cassinelli describes with illustrations in colors the operation suggested by Ivanissevich for varicocele and lauds its advantages.

**Diuretic Effects of Various Drugs.**—The diuretic action of several drugs was studied by Rojo in the dog, using a modification of Schwarz and Wichowky's method. Calcium chloride exerted a manifest diuretic effect, especially in the first ninety and 180 minutes. In the order of their potency, the diuretics stood as follows, amaranthus quitensis, potassium bicarbonate, calcium chloride and saccharose. Euphorbia serpens did not exhibit any diuretic action. As this disagrees with clinical experience, the presence of a persistent renal injury must be assumed in the animals used.

## Semana Médica, Buenos Aires

34: 1017-1076 (April 28) 1927. Partial Index

*Ether Neuritis. A. M. Marque.—p. 1017.
Panoptic Staining. P. T. Panza and C. L. Ducco.—p. 1029.
The Anemias of Infancy. F. Schweizer.—p. 1038.
"Sanocrysin." M. Besimsky and L. V. Rabuffetti.—p. 1043.
Vulvar Myiasis. B. Pogorelsky.—p. 1055.
Umbilico-Iliac Incision. R. V. Hernández.—p. 1057.

**Neuritis Caused by Injections of Ether.**—In three years Marque has seen sixteen cases of paralysis of the lower extremities in children. In all the history brought to light a pulmonary involvement, usually secondary to whooping cough, and intragluteal injections of ether or polyvalent vaccine that contained ether. The paralysis was proportional to the number of injections. In 60 per cent of the cases, the external popliteal and sciatic nerves were those most affected. The tendo achillis reflex was diminished in most and absent in others. These patients are usually referred with a diagnosis of poliomyelitis, as the paralysis develops after a febrile period. Ether is a caustic agent; this property brought about the abandonment of its subcutaneous use. The prognosis in these cases is usually favorable, but in some the disability may last one or two months.

## Archiv für Kinderheilkunde, Stuttgart

81: 81-240 (June 10) 1927

Acrodynia. H. Müller.—p. 81.
Skin Tuberculosis from Sucking of the Thumb. J. Duken.—p. 100.
Endocarditis Lenta in Children. E. Nedelmann.—p. 106.
Parathyroid Extract-Collip and Tetany in Children. H. Süssmann.—p. 114.
Infectious Erythema in Children. L. O. Finkelstein and R. A. Wilfand.—p. 120.
*Action of Ultraviolet Rays on the Blood. H. Koeppe.—p. 133.
Atresia of the Bile Ducts. H. Hespe.—p. 137.
Assimilation of Organic Substances. M. Steuber et al.—p. 154.

Mineral Metabolism in Acute Dyspepsia. E. Rominger and H. Meyer. —p. 176.
Unobjectionable Milk for Infants. P. Reyher.—p. 196.
Stereotypical Bed-Time Phantasies of Children. T. Gött.—p. 217.
Aberration of Measles Enanthema. J. Duken.—p. 219.

**Action of Ultraviolet Rays on the Blood.**—Koeppe compares spontaneous hemolysis in vitro with the lytic action of ultraviolet rays. He concludes that the rays only catalyze the spontaneous process of hemolysis.

## Archiv für die gesamte Physiologie, Berlin

**216:** 609-800 (June 8) 1927

*Complete Separation of Intestinal Loop from Nerves. W. N. Schamoff. —p. 669.
*Function of Isolated Intestinal Loop in Man. M. M. Lewin.—p. 673.
Physiology of the Thymus. F. D. Agafonow.—p. 682.
*Thyroxin and the Sympathetic. E. Abderhalden and E. Wertheimer.—p. 697.
Changes in the Maternal Organism in Pregnancy. F. Liesenfeld et al.—p. 712.
*Hormones of Gonads and the Pituitary. J. Lehmann.—p. 729.
Exogenous Factors in Development of Tadpoles. E. Abderhalden.—p. 749.
Innervation of the Intestine in Vomiting After Administration of Apomorphine. A. G. Kratinoff and A. L. Sack.—p. 753.
Interference Curves and Electrocardiogram of the Ventricle. F. Meyer. —p. 765.
Water Resistance of the Human Body. R. du Bois-Reymond.—p. 770.
Mouth Opening and Evacuating Reflexes in Birds. F. Groebbels.—p. 774.
The Stimulating Substance in Fibrillation of the Heart. L. Haberlandt. —p. 778.
Formation of Heart-Stimulating Substance. L. Haberlandt.—p. 789.
Blood Reaction in the Frog. L. Hertwig-Hondru.—p. 796.

**Complete Separation of Intestinal Loop from Nerves.**—Schamoff elaborated a method of transplantation of an isolated loop of intestine under the skin. Superficial injuries of the visceral peritoneum of such a loop lead to its vascularization from the subcutaneous tissue. After this, the mesentery may be sectioned and the transplanted loop is completely separated from its original nerve and blood supply. Lewin reports his observations on such a loop, isolated by Schamoff in a man with stricture of the esophagus, and later used successfully for the plastic operation. It continued to secrete active intestinal fluid in the fifth month after separation from its original nervous connections. The secretion outside of digestion was strictly periodic. Ingestion of food disturbed this periodic secretion, which is another indication of its humoral mechanism.

**Thyroxin and the Sympathetic.**—In experiments on rats, Abderhalden and Wertheimer were able to prevent the tendency of a meat diet to enhance the action of thyroxin by adding carbohydrates to the diet. Ergotamine also counteracted the action of thyroxin, even when it was administered several days before the latter substance.

**Hormones of Gonads and the Pituitary.**—The histologic structure of the anterior lobe of the pituitary in castrated rats is regarded by Lehmann as a reliable indicator of the action of hormones. He could restore the normal histologic aspect of the gland by injection of ovarian hormone in female or testicular extract (Zondek) in male rats.

## Deutsche medizinische Wochenschrift, Berlin

**53:** 1039-1078 (June 17) 1927

*Labor and Latent Syphilis. T. Heynemann.—p. 1039.
Surgery of Functional Disturbances of the Vessels. F. Brüning.—p. 1041.
Diastase Test in Acute Necrosis of the Pancreas. W. Roloff.—p. 1043.
Pigmentation of the Skin from Hot Applications. R. Mayer-List.—p. 1045.
Müller's Balling Reaction in Serodiagnosis of Syphilis. I. Franz. —p. 1047.
Complement Fixation with Streptococci. E. Vogt.—p. 1049.
Diet in Acute Toxicosis of Infants. E. Rominger.—p. 1050.
*Laboratory Infection with Cholera. A. Sata.—p. 1052.
Measles in Adults. W. Pockels.—p. 1053.
"Boas' Treatment of Hemorrhoids." I. Boas.—p. 1053.
Renal Calculi in Bone Diseases. H. Taterka and L. Dinkin.—p. 1054.
Surgery of Cerebellar Hemorrhage. I. Kron and W. Mintz.—p. 1054.
Ophthalmology in 1926. P. Junius.—p. 1056.
Medical Psychiatry. K. Birnbaum.—p. 1058.
The Alcohol Problem. Neumann.—p. 1059.
Reply. Kaecke.—p. 1060.
Nonspecific Infections of the Kidneys. C. H. Ludowigs.—p. 1073. C'en.

**Labor and Latent Syphilis.**—Tests made with retroplacental blood are even less reliable, according to Heynemann, than tests made with blood from the parturient's vein. In spite of this, he recommends the procedure, since the false results which occur in both cases are practically always "false positives," and since retroplacental blood is easily obtained. The test, if positive, should be repeated one week later.

**Laboratory Infection with Cholera.**—Sata reports a case of laboratory infection with cultures of *Vibrio cholerae asiaticae* which had been isolated one and one half years before. The patient, Dr. Matsusaki, had used all possible precautions.

## Klinische Wochenschrift, Berlin

**6:** 1121-1168 (June 11) 1927

Development of Pulmonary Tuberculosis. V. Romberg.—p. 1121.
Early and Late Cavitation. H. Kausch and R. Klingenstein.—p. 1126.
Diagnosis of Types of Pulmonary Tuberculosis. W. Starlinger.—p. 1129.
Calmette's Tuberculosis Vaccination. H. Selter and W. Blumenberg.—p. 1134.
*Chemotherapy with Gold. A. Feldt.—p. 1136.
Problems of "Sanocrysin." K. Secher.—p. 1139.
Examination of the Skin in Filtered Quartz Light. S. Bommer.—p. 1142.
Recurring Pleuritic Exudate in Secondary Stage of Tuberculosis. F. Scheidemandel.—p. 1145.
Studies on the Heart Hormone. L. Haberlandt.—p. 1147.
*Production of Antigenic Properties in Lipoids. E. Fränkel and L. Tamari.—p. 1148.
Chemotherapy of Tuberculosis. H. Ulrici.—p. 1149.
*Homes and Hospitals Versus Athletic Fields. F. von Cutfeld.—p. 1151.

**Chemotherapy with Gold.**—Feldt reports on chemotherapeutic developments of preparations of gold. One of them, with a comparatively complicated aromatic structure, had an excellent therapeutic index in syphilis of rabbits, recurrens of mice and streptococcus infections. It is almost inactive in vitro.

**Production of Antigenic Properties in Lipoids.**—Fränkel and Tamari observed that injections of a lecithin-cholesterol solution induced formation of antibodies, if the solution was obtained by vigorous rubbing of the substance in water. Such a solution contains larger particles than the solution obtained by mixture of an alcoholic solution with water. Its hydrogen ion concentration was lower (nearer to the iso-electric point). When, in such solutions, they further reduced the electric charge of the particles (by adding calcium chloride), the rabbits responded with a considerable production of antibodies.

**Homes and Hospitals Versus Athletic Fields.**—Gutfeld does not deny the value of athletics, but he believes that, if the authorities are serious in their wish to promote public health, the available money should be spent on improving housing conditions and hospital facilities.

**6:** 1169-1216 (June 18) 1927

Epinephrine and Function of Suprarenals. K. Fromherz.—p. 1169.
*Irradiated Ergosterol. C. Kroetz.—p. 1171.
*Nephelometric Estimation of Trypsin and Pepsin. P. Rona and H. Kleinmann.—p. 1174.
*Significance of Bile for "Molting" of Blood. R. Seyderhelm and H. Tammann.—p. 1177.
*Diuretics and Pituitary Secretion. H. Hoff and P. Wermer.—p. 1180.
*Motor and Sensory Ulnar Nerve Phenomenon. W. Bechterew.—p. 1181.
Gastroduodenal Infection with Colon Bacilli. J. Olivet.—p. 1183.
Conduction Time in Electrocardiography. M. Stoss.—p. 1186.
"Determination of the $p_H$ of Tissues and Secretions." S. Graff.—p. 1188.
*Blood Ammonia. E. Adler and K. Schwerin.—p. 1188.
Pathogenesis and Lysin. K. Marcuse.—p. 1189.
Psychosis from Poisoning with Extractum Filicis. A. Westphal.—p. 1190.
Treatment of Furunculosis. F. Lotsch.—p. 1191.
The Intradermal Test with Salt Solution. F. Göppert.—p. 1194.

**Irradiated Ergosterol.**—Kroetz administered irradiated ergosterol to healthy adults, whose diet contained a sufficient amount of vitamins. Two of the subjects received 18 mg., the other two 30 mg. of the ergosterol (vitamin D) daily. Very slight changes in the metabolism were noted. A moderate lowering of the alkalinity of the blood was about the only outstanding result. The general tendency of the changes was the opposite of what has been observed in rachitic children treated with irradiated ergosterol. Its effects were also different from the effects of irradiation of the same adults with ultraviolet rays.

**Nephelometric Estimation of Trypsin and Pepsin.**—The details of an exact method for estimation of the proteolytic activity of gastric and duodenal contents, suitable for clinical

uses, are published by Rona and Kleinmann. They confirmed the injurious action of gastric contents on trypsin, which, on the other hand, keeps well in a solution of hydrochloric acid of $p_H$ 1.7. This is not due to the action of pepsin, because boiled gastric contents and a corresponding mineral mixture without pepsin, also impaired the quality of trypsin.

**Significance of Bile for "Molting" of Blood.**—The anemia that has been observed in dogs with bile fistula was the object of Seyderhelm and Tammann's study. They eliminated an important source of errors by connecting the gallbladder with the urinary bladder by means of a permanent tube. Anemia with a normal color index and without an increased number of vitally staining erythrocytes developed regularly in their dogs within two or three weeks. The anemia did not progress further than to about two thirds of the original hemoglobin content. Hemosiderosis of the spleen, abdominal lymph nodes, suprarenals and lungs was limited to the reticuloendothelial cells of these organs. The lymph nodes of the respiratory tract were free from iron. Administration of 0.2 Gm. of reduced iron daily cured the anemia. Administration of 0.1 Gm. of cholesterol increased the elimination of bilirubin, as well as the regeneration of the blood cells above the preoperative level. This polycythemia lasted only for four or five weeks and reverted to a graver anemia than was observed in the fistula dogs to which cholesterol was not given. Daily administration of 0.2 Gm. of sodium glycocholate and taurocholate exerted a beneficial influence, and still better results were obtained from daily administration of 4 mg. of activated ergosterol. Splenectomy added to the biliary fistula resulted in grave anemia, and the authors assert that unquestionable megaloblasts appeared in the blood of such a dog.

**Diuretics and Pituitary Secretion.**—Hoff and Wermer found a considerable increase in pituitary hormone in the cisterna fluid removed from dogs and patients during a diuresis provoked by theobromin derivatives, merbaphen or urea. They explain this by a reflex increase in pituitary secretion to prevent further loss of water. The cisterna fluid in three patients with idiopathic diabetes insipidus contained as much pituitary hormone as the fluid from other patients, but the injection of a theobromine preparation did not increase the concentration of the hormone. It seems that the patient with diabetes insipidus is unable to regulate the secretion of the pituitary to his needs.

**Motor and Sensory Ulnar Nerve Phenomenon.**—Bechterew rolls the ulnar nerve of the patient under his finger. Flexion of the fourth and fifth fingers occurs in spasmophilic persons. Under stronger irritability, other fingers, including the thumb, and even the hand and forearm become flexed. With the exception of the movement of the fourth and fifth finger, these phenomena are of reflex origin. Pain or paresthesia represents the sensory part of the phenomenon. If the irritation is repeated, the response increases in some persons. Paresis or paralysis due to a lesion of the upper neurone enhances the reaction. Unilateral sympathicotonia also results in a stronger reflex. Similar phenomena may be produced by irritation of other nerves in grave spasmophilia.

**Blood Ammonia.**—In four out of five cancer patients, Adler and Schwerin found the blood ammonia moderately increased (0.064 mg. instead of 0.02 mg. per hundred cubic centimeters). The combined ammonia ("mother substance") was, however, lower than normal (1.26 mg. instead of 2 mg. per hundred cubic centimeters).

## Medizinische Klinik, Berlin

**23:** 897-932 (June 17) 1927

*The Kidney and Diabetic Coma. I. Snapper.—p. 897.
*Arrhythmia and Pulse Resonator. Goldscheider.—p. 900.
Milk-Free Diet for Infants. K. Ochsenius.—p. 902.
Curative Gymnastic Treatment of Spinal Paralysis of Children. A. T. Möller.—p. 904.
Loss of Hair. E. Saalfeld.—p. 907.
Resorption of Infected Ovum. G. H. Schneider.—p. 909.
Headache Not Caused by Injury to Cheek. W. Brandis.—p. 914.

**The Kidney and Diabetic Coma.**—The pathogenesis of diabetic coma is reviewed by Snapper, chiefly on the basis of his own work. He finds a peculiar insufficiency of the kidneys in coma: retention of nitrogen and inability to oxidize beta-oxybutyric and diacetic acid, which are rapidly destroyed by the normal kidney. A perfused extremity also oxidizes the ketone bodies and at least a part of this process occurs in the muscles. Diabetic coma is due to overproduction of ketone bodies in the liver, with simultaneous impairment of their oxidation in the degenerated kidneys and muscles. Insulin does not help in such cases. The restriction of proteins is indicated in diabetes not only because ketone bodies form from them, but also because the kidneys, which are overloaded with the end-products of protein metabolism, cannot oxidize a sufficient amount of ketone bodies.

**Arrhythmia and Pulse Resonator.**—Goldscheider criticizes some features of Goldschmidt's "pulse resonator," chiefly on the basis of investigations made by his pupil Mosler in 1912. The latter found that in only 9.4 per cent of cases are two succeeding pulses of identical period. Three successive periods were identical in only 1.34 per cent of the pulses. He believes that the apparatus as originally designed is not sufficiently sensitive, but mentions an improvement which registers every pulse interval.

## Münchener medizinische Wochenschrift, Munich

**74:** 917-958 (June 3) 1927

Epidemiology and Bacteriology. K. Kisskalt.—p. 918.
Mud-Fever in Bavaria. W. Rimpau.—p. 921.
Epidemic of Typhoid. H. Doerfler.—p. 924.
Weight of the New-Born. K. Hellmuth.—p. 926.
*Alkali Elimination Test. M. Rosenberg and A. Hellfors.—p. 926.
Tumors of the Carotid Gland. H. Förcken.—p. 931.
Tendovaginitis Causing Stenosis. M. Hackenbroch.—p. 932.
Exercises in Treatment of Flat Foot. O. Kaan.—p. 932.
Prevention of Scoliosis. Gaugele.—p. 933.
Hygiene Attachés. W. H. Hoffmann.—p. 935.
Chinese Therapeutics. A. Hartmann.—p. 935.
*Simple Thinking and Acting in Practice. F. Hamburger.—p. 936.
Appearance of Child and School Hygiene. O. Schneider.—p. 938.

**Alkali Elimination Test.**—Rosenberg and Hellfors administered 20 Gm. of sodium bicarbonate by mouth and tested the hydrogen ion concentration at intervals of a quarter of an hour. The normal kidney is capable of secreting urine of a $p_H$ of at least 8.0 within two hours. The test seems to be more sensitive than the tests for retention of nitrogen or for concentration. The reaction was normal in nephrosis.

**Simple Thinking and Acting in Practice.**—A few examples are cited by Hamburger. An indifferent medicine given with verbal suggestion will cure most cases of cough or habitual vomiting in children, if a physical cause does not exist. It is rational to try this before advising suggestive measures of a more serious nature, such as tonsillectomy. He does not advise telling the parents the truth in this case. Phimosis in boys under 2 years of age may be cured easily by repeated dilation with the fingers (pushing the prepuce back). This method is rarely used because physicians and parents seem to prefer more impressive technics. The diagnosis of meningitis in children with open fontanels is easy: tension or protrusion of this space, except during coughing, is sufficient and is just as reliable as complicated methods. He respects science and research, but not pseudo-exactness.

**74:** 959-998 (June 10) 1927

*Fever Treatment of Gonorrhea. B. Spiethoff.—p. 959.
Asthma and Storm's Chambers. O. König.—p. 960.
*Pressure in the Cisterna. O. Kroiss and H. Dielmann.—p. 966.
Scopolamine-Morphine Plus Ephedrine. F. Lubitz.—p. 966.
Blood Groups and Predisposition to Disease. L. Hermanns and J. Kronberg.—p. 967.
*Metal Salts and Estrual Cycle. A. Buschke and L. Bermann.—p. 969.
Bacteriologic Diagnosis of Typhoid, Paratyphoid and Dysentery. C. Schlirf.—p. 970.
*Dangers of Forcible Correction of Club Foot. H. Bürkle-de la Camp.—p. 974.
Finger Splint. F. Schnek.—p. 977.
Back Support in Writing. T. Wohrizek.—p. 979.
*"Yellow Ointment." Zinsser.—p. 982.

**Fever Treatment of Gonorrhea.**—Although malaria alone (ten attacks) did not cure gonorrhea, Spiethoff believes that it shortened the course of it and he intends to continue with his experiments.

**Pressure in the Cisterna.**—Positive pressure of the cerebrospinal fluid was found in all of the seven epileptic patients in whom Kroiss and Dielmann performed puncture.

**Metal Salts and Estrual Cycle.**—Buschke and Bermann fed young mice with small amounts of lead acetate (diluted 1:1,000). These animals remained smaller than the controls and estrus did not occur. Arsenic inhibited the estrus to a less degree. This shows that the inhibition of estrus by thallium is not as specific as the other actions of this metal.

**Dangers of Forcible Correction of Club Foot.**—Bürkle-de la Camp made forcible manual correction of a club foot just before amputating the leg in a few patients. The examination of the club foot showed considerable injuries to the tissues. He pleads for conservative treatment in children and for surgery in adults.

**"Yellow Ointment."**—Zinsser extols the advantages of an ointment containing 10 per cent of yellow oxide of mercury in treatment of furuncles and phlegmons.

**74:** 999-1040 (June 17) 1927

Heredity. O. von Verschuer.—p. 999.
Medical Examinations of Ski-Runners. J. Kaup et al.—p. 1002.
Treatment of Syphilis in Children. R. von den Steinen.—p. 1006.
*Insulin and Action of Ephedrine on Blood Pressure. K. Csépai and S. von Pinter-Kováts.—p. 1011.
Bacillus Suipestifer Infection in Man. Schnitter.—p. 1011.
Perityphlitis Versus Typhoid. F. Schmitz.—p. 1013.
Scarlet Fever Antitoxin in Erysipelas. S. Ben Schabetai.—p. 1015.
Cavernous Hemolymphangioma of the Breast. H. U. Kallius.—p. 1016.
*Acidity of the Vaginal Secretion in Cervical Gonorrhea. A. Heyn.—p. 1017.
Roentgen-Ray Dosage in Dermatology. Thedering.—p. 1019.
Treatment of Club-Foot. G. Frey.—p. 1021.
Influenza, Chorea and Phenobarbital. W. Kaupe.—p. 1022.
Legislation on Venereal Diseases. R. Breitschwerdt.—p. 1022.

**Insulin and Action of Ephedrine on Blood Pressure.**—Csépai and Pinter-Kováts found that insulin does not counteract the action of ephedrine on blood pressure. This observation shows an important difference between the action of epinephrine and ephedrine.

**Acidity of Vaginal Secretion in Cervical Gonorrhea.**—Heyn concludes that the acidity of the vaginal secretion is the same in gonorrhea as in other diseases of the cervix or vagina.

## Wiener klinische Wochenschrift, Vienna

**40:** 773-804 (June 16) 1927

Antivirus. E. Epstein.—p. 773.
Therapeutic Solution of Halogens. E. Risak.—p. 778.
Mixed Tumors of the Soft Palate. F. Koch.—p. 780.
Aphorisms on Cavities. A. Wolff-Eisner.—p. 780.
Diabetes and Balneotherapy. G. Arany.—p. 783.
Teaching and Research in Ophthalmology. K. Lindner.—p. 784.
*Iodine Treatment in Surgery of Exophthalmic Goiter. F. Schürer-Waldheim.—p. 787. C'en.
Surgery of Hemorrhoids. J. Schnitzler.—p. 789.
Diagnostic Significance of Gastric Contents. O. Porges.—p. 791.
Criminal and Mentally Abnormal Children. E. Lazar. Supplement.—pp. 1-14.

**Iodine Treatment in Surgery of Exophthalmic Goiter.**—Schürer-Waldheim recommends brief (six to ten days) preoperative treatment with iodine. Postoperative shock did not occur in his thirteen patients in whom he continued the administration of iodine for six or seven days after the intervention.

## Zeitschrift f d. ges. experimentelle Medizin, Berlin

**55:** 607-828 (June 4) 1927

*Path of Cardiac and Aortic Pain. R. Singer and E. A. Spiegel.—p. 607.
*Sulphur Treatment of Diabetes. E. Földes.—p. 615.
Shape of Pleural Effusions. H. Liebig.—p. 627.
Alkali Reserve in Exertion. Rehberg and Wissemann.—p. 641.
*Parenteral Injection of Proteins and Gas Metabolism. E. Meyer.—p. 649.
Concentration or Dye and Vital Staining. W. M. Konstantinow.—p. 659.
*Colorimeter Without Standard Fluid. A. Adler.—p. 672.
After-Effect of Exertion on Oxygen Consumption. E. Radtke.—p. 694.
*Therapeutic Experiences in Streptococcus Infections. N. Louros and H. E. Scheyer.—p. 702.
Treatment of Streptococcus Infection with Charcoal Injections. N. Louros and H. E. Scheyer.—p. 724.
The Blood Picture and the Reticulo-Endothelial System in Streptococcus Infection. A. Schmechel and H. Lehfeldt.—p. 731.
Cardiovascular Antagonism of Pituitary Extract and Insulin. J. Pogány and S. V. Pintér-Kováts.—p. 744.
Function of the Extrahepatic Biliary Passages. H. Erbsen and E. Damm.—p. 748.
Hormones and Hepatic Secretion. H. Erbsen and E. Damm.—p. 757.
Parasystolia. A. Schott.—p. 762.
Pharmacology of the Isolated Ureter. H. Rothmann.—p. 776.
Muscle Atrophy After Extirpation of the Cervical Sympathetic. K. Kuré et al.—p. 782.
Action of Vegetative Poisons on Dystrophic Muscles. K. Kuré et al.—p. 789.
Experiments on Vegetative Nervous System. E. Herzfeld et al.—p. 797.
The Heart and Arteries in Syphilitic Rabbits. S. Bergel.—p. 801.
Studies on Capillaries. M. Klingmüller.—p. 808.

**Path of Cardiac and Aortic Pain.**—Singer and Spiegel traced in dogs the path of painful stimuli from the heart and aorta over the stellate ganglions to the posterior roots of the eighth cervical and the first four thoracic segments. Considerable hypesthesia could be obtained, even when some of these roots remained intact.

**Sulphur Treatment of Diabetes.**—From 0.1 to 0.5 Gm. of precipitated sulphur or from 1 to 15 drops of a 33 per cent solution of ammonium sulpho-ichthyolicum was administered by Földes to diabetic patients by mouth before meals. He observed a favorable action on sugar tolerance. In patients with signs of hypothyroidism, the sulphur acted only in combination with thyroid extract.

**Parenteral Injection of Proteins and Gas Metabolism.**—Meyer injected from 4 to 10 cc. of a milk preparation intramuscularly. The first result, occurring in about an hour, was depression of the respiratory metabolism; this was followed, after three or four hours, by increase in the respiratory metabolism. The reaction is dependent on the irritability of the vegetative nervous system.

**Colorimeter Without Standard Fluid.**—Adler describes his apparatus, which measures the absorption of light directly. The subjective factor in colorimetry is considerably reduced.

**Therapeutic Experience in Streptococcus Infections.**—By various preparations intended to stimulate the reticulo-endothelial system, Louros and Scheyer prevented streptococcus infection of mice or prolonged the life of mice thus infected. Proteins and some drugs acting on the vegetative nervous system, for instance, epinephrine in extremely high dilutions administered daily, gave encouraging results. A preparation of ergot was especially effective, perhaps because of the paralysis of the sympathetic and predominance of the vagus which it induced.

## Zeitschrift für Kreislaufforschung, Dresden

**19:** 409-440 (June 15) 1927

Reflex Self-Regulation of Blood Pressure. H. E. Hering.—p. 410.
Congenital Syphilitic Stenosis of the Aorta. G. Katz and W. Selig.—p. 415.

## Zentralblatt für Gynäkologie, Leipzig

**51:** 1025-1088 (April 23) 1927

*Criticism of Insulin Therapy in Pregnancy Toxicosis. O. Bokelmann.—p. 1026.
Influence of Pregnancy on the Biliary Tract. G. d'Amato and E. Gmelin.—p. 1031.
Primary Carcinoma of the Fallopian Tube. H. Bültemann.—p. 1037.
*Ephedrine in Treatment of Dysmenorrhea. O. Lang.—p. 1043.
Vasoconstrictive Action of Certain Ecbolics. W. Zorn.—p. 1046.
Castor Oil and Pituitary Extract in Induction of Labor. K. Adler.—p. 1049.
Short Umbilical Cord as Hindrance to Birth. M. Greiffenberg.—p. 1054.
Danger to Mother and Child from Short Umbilical Cord. W. Kolde.—p. 1056.
Formation of Artificial Vagina. A. Mandelstamm.—p. 1058.

**Criticism of Insulin Treatment of Pregnancy Toxicosis.**—Bokelmann protests against the arguments and conclusions of Loeser, published in the same journal in December, 1926. This kind of insulin therapy, he says, is based on false premises and offers at best an indirect and dangerous route to the goal sought, in place of the direct and safe one.

**Ephedrine in Treatment of Dysmenorrhea.**—Lang reports relief of pain and reduction in amount and duration of the bleeding in essential and inflammatory dysmenorrhea. The drug acts by stimulating the smooth musculature and sympathetic nerve endings. It was given as soon as pain set in. From 0.01 to 0.05 Gm. was given by mouth two or three times a day, according to tolerance, which is best determined by Aschner's eyeball pressure test.

**51:** 1089-1152 (April 30) 1927

Metrosalpingography in Diagnosis. K. Jaroschka.—p. 1097.
*Sugar Metabolism in Pregnancy. H. R. Schmidt.—p. 1107.
*Protein Metabolism in Pregnancy. P. Jonen.—p. 1109.
Diagnostic Value of the Hofstätter-Cullen-Hellendall Sign. R. Hofstätter. —p. 1112.
"Radiotherapy of Carcinoma of the Cervix." W. Fürst.—p. 1115.
*Fatal Hemorrhage in Abortion. F. Bass.—p. 1119.
Bacteriology of Rectal Examination During Labor. T. Koller and A. Reist.—p. 1123.
Artificial Vagina by Snegireff's Method. M. Scharapo.—p. 1131.

**Metabolism of Sugar and Protein in Pregnancy.**—Schmidt found that the glycogen of the liver greatly decreased in gravid dogs, while the fat content was unaltered, or, in the case of dogs given a minimum of protein, increased. The deposits of fat are, he points out, a physiologic process; the fat is used to form glycogen. This may explain the lipemia characteristic of pregnancy and also throw light on the ketonuria of pregnancy, since a preliminary step in the formation of glycogen from fats or in any other utilization of fats in the body, is their transformation into ketonic acids. Ketonuria in pregnancy would, accordingly, indicate insufficiency of the liver in respect to glycogen formation. The water, total nitrogen and residual nitrogen curves of the undernourished dogs of this experiment are analyzed by Jonen. It appeared that in the period of relative inanition the maternal organism was forced to mobilize its own substance in order to satisfy the protein hunger of the fetus. The weight of the animals remained constant throughout the pregnancy. The question whether or not the maternal organism possesses the necessary protein to supply the needs of the fetus cannot be decided merely on the ground of weight, since, in a state of hunger, water is retained.

**Fatal Hemorrhage in Abortion.**—Two cases are reported by Bass. The special cause of the hemorrhage could not be ascertained in either case. He believes that hemorrhage should be more seriously considered in the indications for active treatment. Not alone the severity of the hemorrhage, but the existing anemia of the patient, must be a factor in the decision.

## Zentralblatt für innere Medizin, Leipzig

**48:** 577-600 (June 11) 1927

*Potassium-Calcium Ratio After Administration of Urea. R. E. Mark and E. Kohl-Egger.—p. 578.
A Gastric Function Test. P. Mahler and Z. Stary.—p. 584.

**48:** 601-624 (June 18) 1927

Dick Test and Blanching Phenomenon. L. Jacobowitz.—p. 602.

**Potassium-Calcium Ratio After Administration of Urea.**—Mark and Kohl-Egger determined the potassium and calcium content of the serum of dogs after administration of from 20 to 30 Gm. of urea by mouth. In dogs with good renal function the potassium did not change, while the calcium increased almost two-fold. In dogs with renal insufficiency, the calcium content remained comparatively low while the potassium content increased considerably—up to 139.3 mg. per hundred cubic centimeters of the serum.

## Klinicheskaya Meditsina, Moscow

**5:** 407-462 (April) 1927

The Theory of Infections. I. V. Davydovskiy.—p. 407.
Use of Albumin Milk in Artificial Feeding. R. O. Lunts.—p. 415.
Roentgen-Ray Treatment of Tumors in Infundibular-Pituitary Region. S. I. Uvarova-Jakobson.—p. 422.
Autoserotherapy of Cancer. S. V. Kaufman.—p. 433.
Cystic Degeneration of the Kidney. J. B. Voitashevskiy.—p. 437.
Clinical Study of Sarcoma of the Ovary. G. K. Zhivatoff.—p. 441.

**5:** 463-518 (April) 1927. Partial Index

The Theory of Infections. I. V. Davydovskiy.—p. 463. C'en.
The Composition of the Blood in Hodgkin's Disease. A. N. Bondyreff. —p. 473.
Respiratory Exercises in Pulmonary Tuberculosis. V. M. Grigorieff.—p. 492.
*High Frequency Currents in Treatment of Prostatitis. V. A. Lukasheff. —p. 502.

**Use of High Frequency Currents in Treatment of Chronic Prostatitis.**—Lukasheff reports five cases of chronic prostatitis in which this treatment, employed alone, brought good results. The strength of the currents was from 50 to 150 milliamperes; the force of the discharge, over 10,000 volts. A glass bougie containing the electrode was introduced into the rectum with the patient lying on his right side with flexed thighs. The exposures were repeated at intervals of one day. The duration of each of the first ten sittings was ten minutes; that of the subsequent sittings, fifteen minutes. The treatment usually included twenty sittings. Considerable improvement was noted after seven or eight exposures. The inflammatory process in the prostate ceased; the size of the gland decreased; constipation disappeared. It appears that the d'Arsonval currents improve the blood circulation in the prostate and thus favor resorption of the products of inflammation by the veins and by the lymphatics of the gland. Besides this, the currents may enhance the tonus of the prostatic muscles.

## Mikrobiologicheskiy Jurnal, Leningrad

**4:** 87-164, 1927. Partial Index

Biochemism of Diphtheria Bacillus and of Proteins of the Animal Organism. V. M. Kryzhanovskiy.—p. 87.
Determination of Antitoxin in Antidysenteric Serum. B. J. Elbert.—p. 99.
Treatment of Scarlet Fever with Antitoxic Serum. K. I. Sokolova.—p. 115.
*Use of Boric Acid for Preservation of Hemolytic Serums. V. S. Kalinina and S. I. Ginzburg.—p. 120.

**Use of Boric Acid for Preservation of Hemolytic Serums.**—Kalinina and Ginzburg assert that in their researches boric acid proved to be very valuable in preservation of hemolytic serums. The serums are poured into tubes; they are then inactivated and boric acid powder is added. One part of the acid is mixed with one hundred parts of serum. The method was used in preservation of nineteen series of hemolytic serums. The titer of the serums had not changed in eight months; the course of the hemolysis reaction was unmodified. Owing to the boric acid, the serums remained free from bacteria and fungi. Their limpidity and color did not alter. Furthermore, boric acid is cheap and nontoxic.

## Acta Pædiatrica, Stockholm

**7:** Supplement, pp. 9-133 (June 10) 1927

Sedimentation Speed in Scarlet Fever. H. Rhodin.—p. 9.

## Finska Läkaresällskapets Handlingar, Helsingfors

**69:** 375-464 (May) 1927

*Treatment of Chronic Epidemic Encephalitis with Recurrent Fever. H. Marcus et al.—p. 375.
Optokinetic Visual Illusions. T. Leiri.—p. 409.
The Restraining Effect of the Rods on the Function of the Cones. A. Lindroos et al.—p. 419.

**Treatment of Chronic Epidemic Encephalitis with Recurrent Fever.**—Marcus, Kling and Höglund have employed recurrent fever treatment in chronic types of epidemic encephalitis, but do not report definite results, since the material was small and the time too short. Previous results, however, are so encouraging that they believe the method should be given a thorough trial.

## Svenska Läkaresällskapets Handlingar, Stockholm

**53:** 1-112, 1927. Partial Index

Care of the Dangerous and Criminal Insane. A. Petrén.—p. 12.
Psychologic Effects of Alcohol. J. Billström.—p. 23.
Depression-Reaction in Nervous and Mental Diseases. B. A. Boye.—p. 39.
Orthopedic Treatment of Mastication Tic. A. Wersén.—p. 47.
Dispensaries for the Insane. G. Elander.—p. 53.
Manic Depressive Psychosis. F. Wiesel.—p. 62.
*Compulsive Insanity and the Basal Ganglia. S. Stenberg.—p. 70.
Results of the Treatment of Neurotic Patients. G. Kahlmeter.—p. 81.
Achrocephalosyndactylia. V. Wigert.—p. 91.

**Compulsive Insanity and the Basal Ganglia.**—Stenberg suggests that the constitutional predisposition to compulsion-phenomena, frequently situated in the subcortical ganglia, may be latent or manifest. This would explain the appearance of these phenomena, sometimes as a disorder existing during the entire life, and sometimes as an episodic disturbance in connection with different nervous conditions, and also the rapid transition to normal.